ORDER NO. ITD85030953C1
B1

Service Manual

Color Television

CTG-1349R/CTG-1362R

NMX-L5 Chassis

CTG-1362R

CTG-1349R

The service technician is required to read and follow the "Safety Precautions" and "Important Safety Notice" in this service manual.

Specifications

Power Source:	120 V AC, 60 Hz
Power Consumption:	62 W average
Antenna Impedance:	300 Ω balanced type(for UHF) 75 Ω coaxial type(for VHF)
Receiving System:	NTSC Standard
Receiving Channels:	Regular TV VHF BAND (2 ~ 13) UHF BAND (14 ~ 69) CATV VHF BAND (4 + (Formerly 5A),ICC5,ICC6) MID BAND (A-5 ~ A-1,A-I) SUPER BAND (J ~ W) HYPER BAND (AA ~ ZZ,AAA,BBB) ULTRA BAND (65 ~ 94)
Intermediate Frequency:	Video I-F carrier 45.75 MHz Sound I-F carrier 41.25 MHz Color sub carrier 42.17 MHz
Semiconductors:	I.Cs .....10 Transistors.....30 Diodes.....54 Posistor.....1
Anode Voltage:	24.0 kV, + 0.5 kV,-2.0 kV at zero beam current
Picture Tube:	A34JCD31X 13 inches measured diagonally 90° deflection
Speaker Output:	1.5 W maximum 16 Ω impedance
Remote Control:	19 Functions
Dimensions:	Height : 13-3/16″ (335mm) Width : 13-3/8″ (340mm) Depth : 14-7/8″ (378mm)
Weight:	23-5/8 lbs.(10.7 kg)

Specifications are subject to change without notice.

Weight and dimensions shown are approximate.

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THESE MODELS COMPLY WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE

IMPORTANT SAFETY NOTICE

There are special components used in Panasonic TV which are important for safety. These parts are shaded on the schematic diagram. It is essential that these critical parts should be replaced with manufactuer's specified parts to prevent X-radiation, shock, fire, or other hazards. Do not modify the original design without permission of Matsushita Electric.

SAFETY PRECAUTIONS

GENERAL GUIDE LINES

1. It is advisable to insert an isolation transformer in the AC supply before servicing a hot chassis.
2. When servicing, observe the original lead dress, especially the lead dress in the high voltage circuits. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
3. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers, shields, and isolation R-C combinations, are properly installed.
4. Before turning the receiver on, measure the resistance between B+ line and chassis ground. Connect ⊖side of an ohmmeter to tne B+ lines, and ⊕side to chassis ground. Each line should have more resistance than specified, as follows.

B+ Line	Minimum Resistance
130 V	3 kΩ
24 V	450 Ω
12 V	400 Ω

5. When the receiver is not to be used for a long period of time, unplug the power cord from the AC outlet.
6. Potentials, as high as 24.5 kV are present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment. Always discharge the anode of the picture tube to the receiver chassis before handling the tube.
7. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT HOT CHECK

(See figure 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5 kΩ, 10 W resistor, in parallel with a 0.15 uF capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity,to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the receiver should be repaired and rechecked before it is returned to the customer.

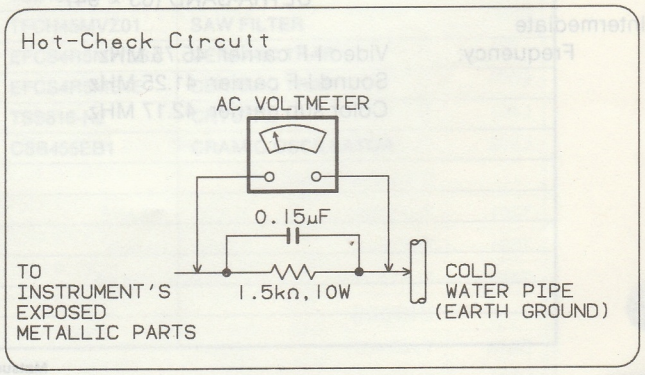


Figure 1

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Turn on the Receiver's power switch.
3. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the Receiver, such as screwheads, antennas, connectors, control shafts, etc,. When the exposed metallic part has a return path to the chassis, the reading should be between 240 kΩ and 5.2 MΩ. When the exposed metal does not have a return path tothe chassis, the reading must be ∞.

X-RADIATION

WARNING :

1. The potential source of X-Radiation in receiver sets is the High Voltage section and the picture tube.
2. When using a picture tube test jig for service, ensure that jig is capable of handling 24.5 kV without causing X-Radiation.

NOTE :

It is important to use an accurate periodically calibrated high voltage meter.

1. Turn the Brightness control fully counterclockwise.
2. Set the SERVICE switch to SERVICE.
3. Measure the High Voltage. The meter(electrostatic type) reading should indicate 24.0 kV,(+0.5, -2.0) kV If the meter indication is out of tolerance,immediate service and correction is required to prevent the possibility of premature component failure.
4. To prevent an X-Radiation possibility, it is essential to use the specified picture tube.

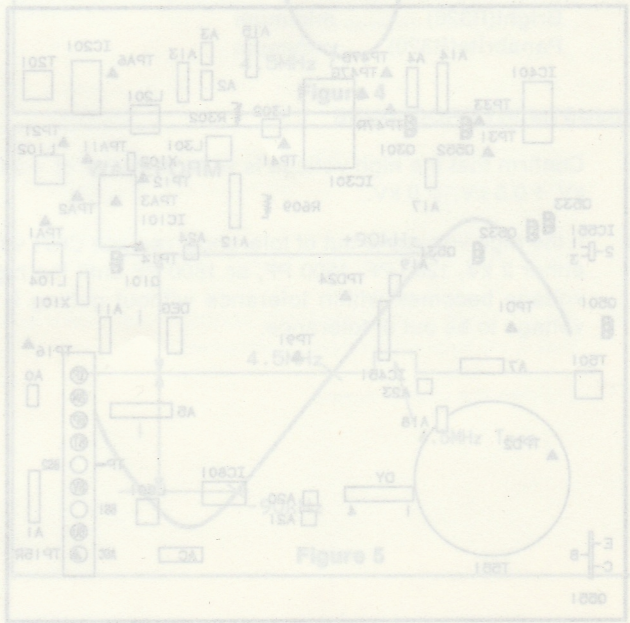
HORIZONTAL OSC. DISABLE CIRCUIT TEST

This test must be made as a final check before the set is returned to the customer.

1. With the rear cover removed, supply a normal 120 V AC to the set, turn on the power switch.
2. Set the customer controls to normal operating positions.
3. Short R803 between pin 3 of IC801 and TP91 on the A-board with a jumper wire. Confirm that the picture falls out of horizontal sync. If this does not occur, the Horizontal oscillator disable circuit is not operating. Follow instructions below for repair produres before the set is returned to customer.

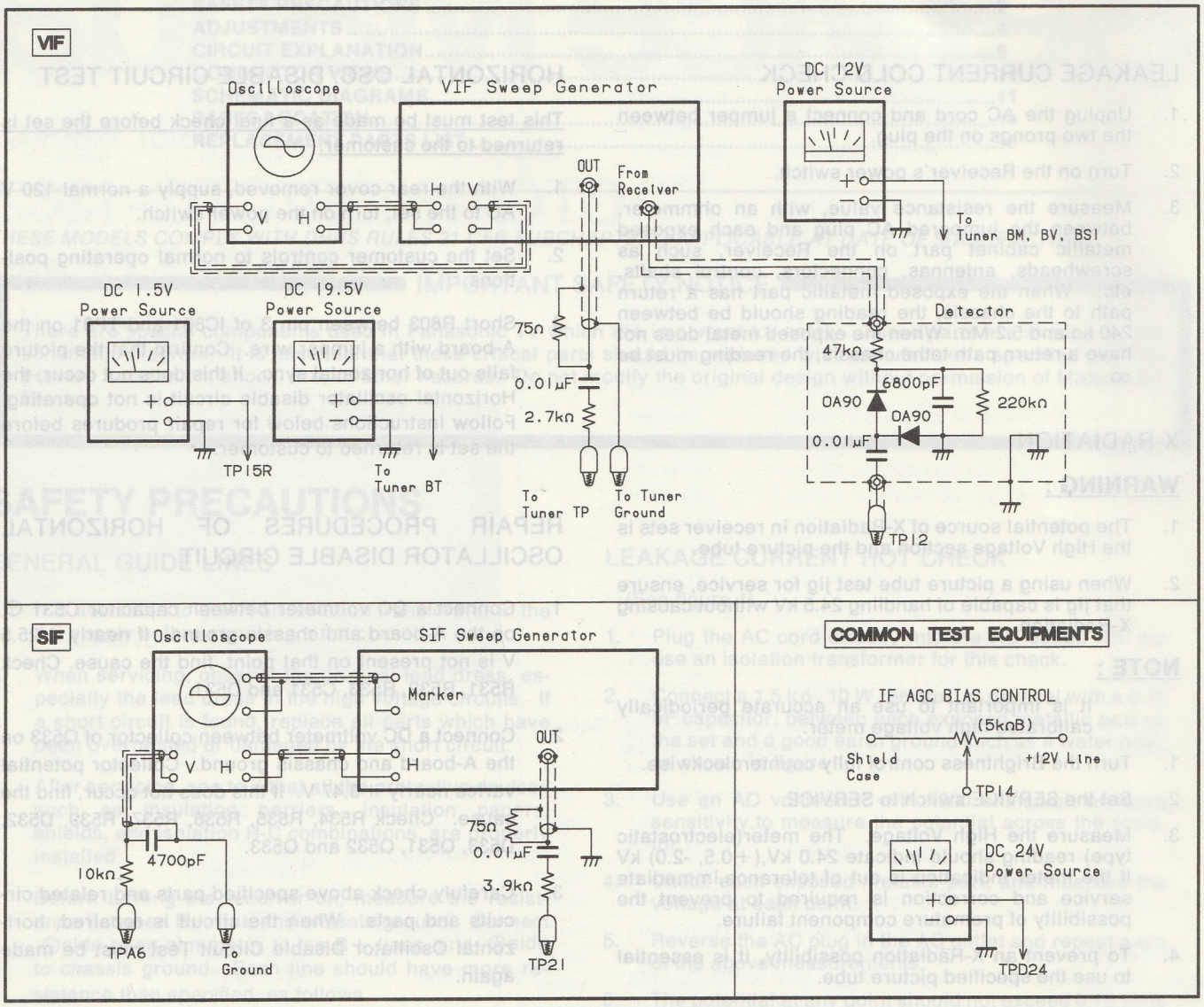
REPAIR PROCEDURES OF HORIZONTAL OSCILLATOR DISABLE CIRCUIT

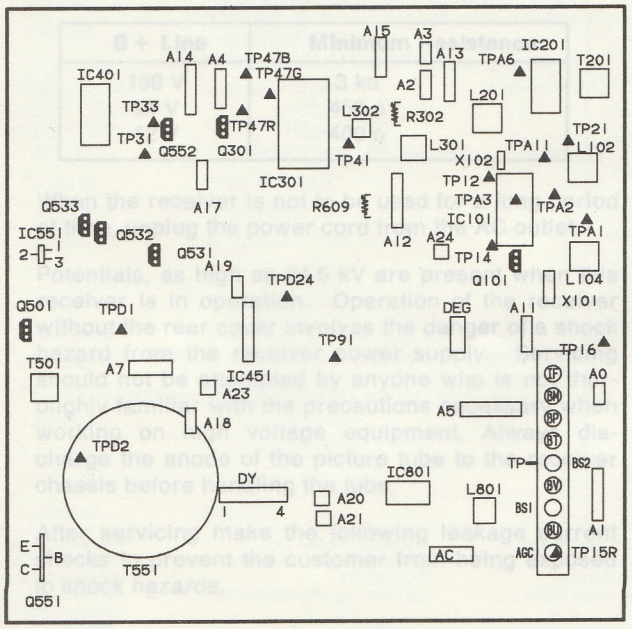
1. Connect a DC voltmeter between capacitor C531 ⊕ on the A-board and chassis ground. If nearly +25.5 V is not present on that point, find the cause. Check R531, R532, R533, C531 and D531.
2. Connect a DC voltmeter between collector of Q533 on the A-board and chassis ground. Collector potential varies nearly +0.47 V. If this does not occur, find the cause. Check R534, R535, R536, R537, R539, D532, D533, Q531, Q532 and Q533.
3. Carefuly check above specified parts and related circuits and parts. When the circuit is repaired, horizontal Oscillator Disable Circuit Test must be made again.



ADJUSTMENTS

Test Equipments and Main Parts Location Chart





▲ : Test Point

Note: Set up for adjustment is shown for receiver disconnected from AC line.

Figure 2

VIF

PREPARATION

1. Test equipment connection is shown in figure 2.
2. Supply AGC bias voltage to TP14.
3. Set Service Switch to SERVICE.
4. Connect a C-jumper(1 uF) between TPA1 and chassis ground.
5. Supply DC voltage :
   DC 1.5 V to Tuner TP15R
   DC 12 V to Tuner BM,BV,BS1
   DC 19.5 V to Tuner BT
   DC 24 V to TPD24

ADJUSTMENT PROCEDURE

1. Adjust the VCO coil (L102) so that the zero beat position is at the center as in figure 3.
2. Adjust attached AGC bias control (5 kΩB) to set the voltage at maximam gain.
3. Set sweep generator output at a point where detector output voltage becomes 0.3 Vp-p on oscilloscope.
4. Increase the output level by 20 dB, then adjust AGC bias control to achieve detector output voltage of 0.3 Vp-p again on oscilloscope.
5. Adjust tuner converter coil to achieve a waveform as that of figure 3 with maximum amplitude at arround 44 MHz.
6. Make sure that there is no spurious oscillation by varying sweep output by ±15 dB while adjusting AGC bias control.
7. Adjust the VCO coil (L102) so that the zero beat position overlap with 45.75 MHz marker.

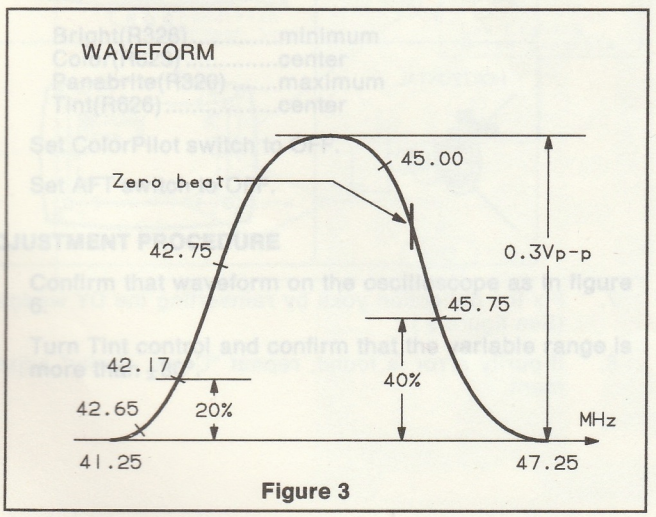


Figure 3

SIF

PREPARATION

1. Test equipment connection is shown in figure 2.
2. Supply AGC bias voltage to TP14.
3. Connect a C-jumper (0.01 uF) between TPA11 and chassis ground.
4. Supply DC voltage :
   DC 24 V to TPD24

ADJUSTMENT PROCEDURE

1. Cut-IF circuit function off by setting attached AGC bias control to maximum.
2. Set sweep generator output level to 25 mVp-p (75 Ω open).
3. Adjust T201 for maximum 4.5 MHz marker as in figure 4.
4. Set sweep generator output level to 5.0 Vp-p (75 Ω open).
5. Adjust L201 to achieve a waveform as in figure 5.
6. Confirm that the waveform line between ±90 kHz point is straight and shows more than 3.0 Vp-p in amplitude as in figure 5.

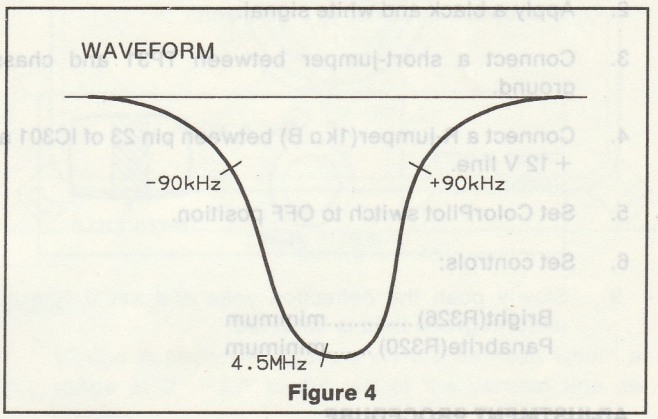


Figure 4

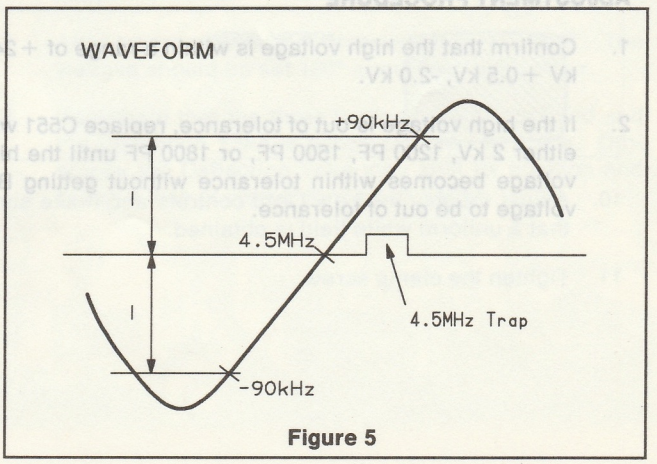


Figure 5

B+ VOLTAGE

PREPARATION

1. Connect a DC voltmeter between TP91 and chassis ground.
2. Set Controls:

   Bright(R326) .....minimum
   Panabrite(R320) .....minimum
3. Set ColorPilot switch to OFF position.
4. Adjust Sub Bright(R308)control to make the raster disappear.

ADJUSTMENT PROCEDURE

1. Confirm B+ votage:

TP91	130 V ± 1.0 V
TPD24	24 V± 1.5 V
Connector B5	12 V± 1.0 V

HIGH VOLTAGE

PREPARATION

1. Connect a high voltage meter anode of the picture tube.
2. Apply a black and white signal.
3. Connect a short-jumper between TP31 and chassis ground.
4. Connect a R-jumper(1kΩ B) between pin 23 of IC301 and +12 V line.
5. Set ColorPilot switch to OFF position.
6. Set controls:

   Bright(R326) .....minimum
   Panabrite(R320) .....minimum

ADJUSTMENT PROCEDURE

1. Confirm that the high voltage is within a range of +24.0 kV +0.5 kV, -2.0 kV.
2. If the high voltage is out of tolerance, replace C551 with either 2 kV, 1200 PF, 1500 PF, or 1800 PF until the high voltage becomes within tolerance without getting B+ voltage to be out of tolerance.

AFT

PREPARATION

1. Receive a VHF high channel.
2. Set SERVICE switch to SERVICE position.
3. Connect a DC voltmeter between TPS2 and chassis ground.

ADJUSTMENT PROCEDURE

1. Adjust L104 for 6.5 V ±0.5 V reading of the voltmeter.

CONTRAST

PREPARATION

1. Apply a black and white signal.
2. Connect an oscilloscope to pin 23 of IC301.

ADJUSTMENT PROCEDURE

1. Adjust Sub Contrast control(R302) to achieve a waveform as in figure 6.

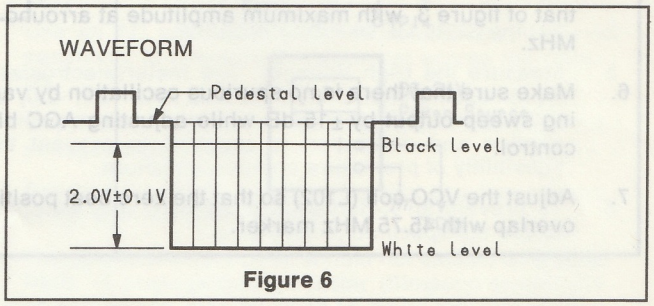


Figure 6

APC

PREPARATION

1. Connect a DC voltmeter between pin 15 of IC301 and chassis ground.
2. Apply a color bar signal.
3. Set controls:

   Panabrite(R320) .....maximum
   Color(R623) .....center
   Tint(R626) .....center

4. Set ColorPilot switch to OFF.

ADJUSTMENT PROCEDURE

1. Turn CW Adj.(R609) control to keep color synchronization.

   (Change channel and confirm that color synchronization is stable.)

2. Read indication on the DC voltmeter down to the second digit below the decimal point.
3. Apply a color bar signal.
4. Connect a short jumper between TP41 and chassis ground.
5. Adjust CW Adj.control to obtain the value specified in item 2 within a tolerance ±0.02 V using the DC voltmeter.
6. Disconnect DC voltmeter and apply a color bar signal.
7. Change channel and confirm that color synchronization is stable.

COLOR OUTPUT

PREPARATION

1. Apply a rainbow color bar signal.
2. Connect an oscilloscope to TP47R.

   Note: When using a probe with low input capacity (10 to 1), connect oscilloscope through resistor (10 kΩ) to TP47R.

3. Set controls:

   Bright(R326) .....minimum
   Color(R623) .....center
   Panabrite(R320) .....maximum
   Tint(R626) .....center

4. Set ColorPilot switch to OFF.
5. Set AFT switch to OFF.

ADJUSTMENT PROCEDURE

1. Confirm that waveform on the oscilloscope as in figure 6.
2. Turn Tint control and confirm that the variable range is more than ±30°.

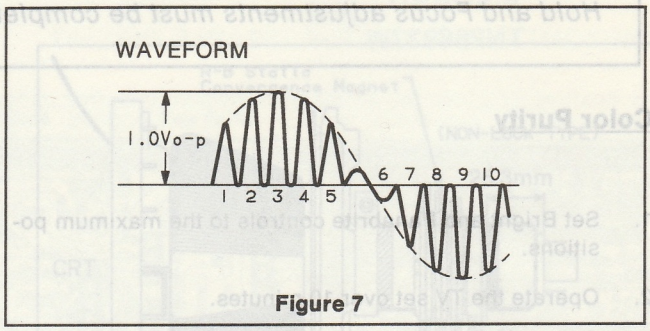


Figure 7

REFFERENCE OSC.TRIMMER

PREPARATION

1. Connect a frequency counter between TPS1 and chassis ground.
2. Turn on the receiver.

ADJUSTMENT PROCEDURE

1. Adjust refference oscillator trimmer.
2. Reading of the counter : 7812.500 ±0.031 Hz.

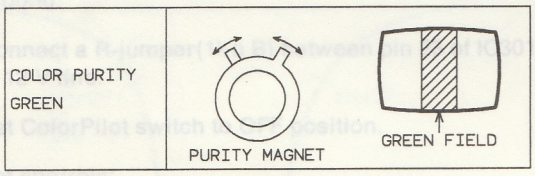
Before Color Purity, Convergence and White Balance adjustments are attempted, V. Hold, H. Hold and Focus adjustments must be completed.

Color Purity

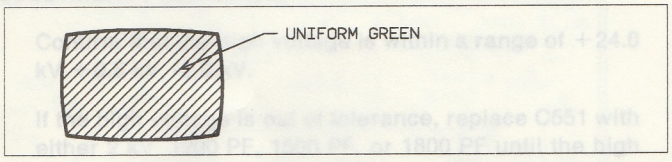
1. Set Bright and Panabrite controls to the maximum positions.
2. Operate the TV set over 10 minutes.
3. Fully degauss the picture tube by using an external degaussing coil.
4. Apply a crosshatch pattern signal and adjust roughly the static convergence magnets.
5. Receive a black and white signal.
6. Set Low Light controls as following:

   Red (R 354)---------Min.

   Blue (R 355)--------Min.
7. Loosen a clamp screw for the deflection yoke and move the deflection yoke as close to the purity magnet as possible.
8. Adjust the purity magnet so that a vertical green field is obtained at center of the screen.



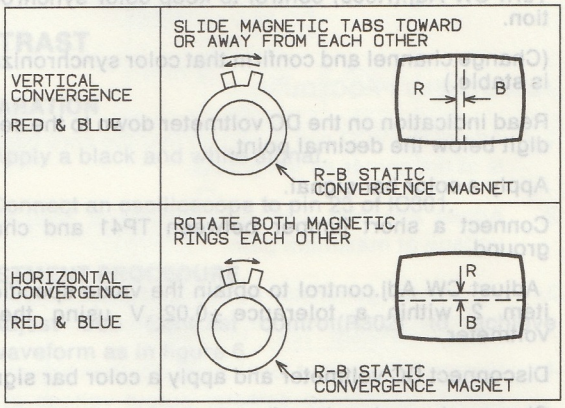
9. Slowly push the deflection yoke and set it where a uniform green field is obtained.



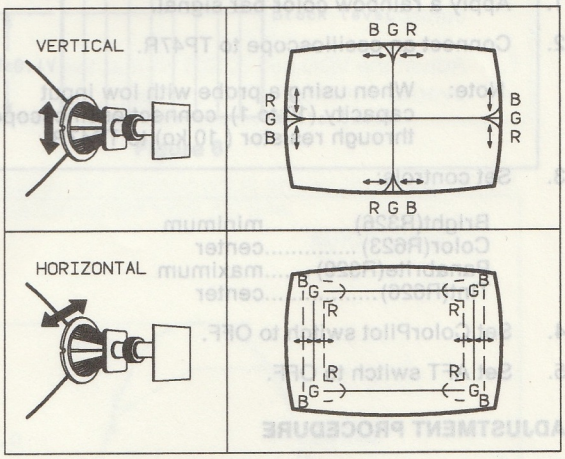
10. Adjust roughly the Low Light controls and make sure that a uniform white field is obtained.
11. Tighten the clamp screw.

Convergence

1. Apply a crosshatch pattern signal and set Panabrite control to the maximum position.
2. Adjust Bright control to obtain a clear pattern.
3. Adjust Red and Blue line at center of the screen by rotating R-B static convergence magnet.



4. Adjust Red and Blue with Green line at center of the screen by rotating (RB)-G static convergence magnet.
5. Lock convergence magnets with silicone sealer.
6. Remove the DY wedges and slightly tilt the deflection yoke the vertically and horizontally to obtain the good overall convergence.



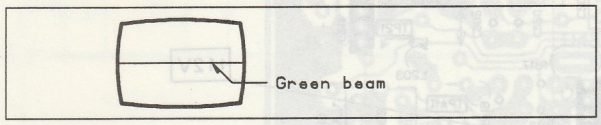
7. Fix the deflection yoke by reinserting the DY wedges. (See figure 9)
8. If purity error is found, repeat "Color Purity" adjustment.

White Balance

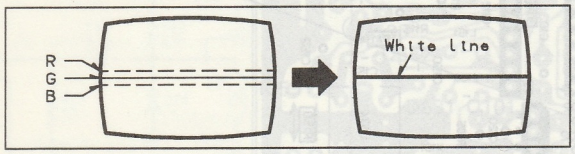
1. Receive a black and white signal and set ColorPilot switch to OFF.
2. Set controls as following:

R-Low Light	(R354)	Mid.
B-Low Light	(R355)	Mid.
R-Drive	(R357)	45° clockwise
B-Drive	(R358)	from the center.
Screen	(R362)	Min.
Color	(R623)	Min.
Tint	(R626)	Mid.

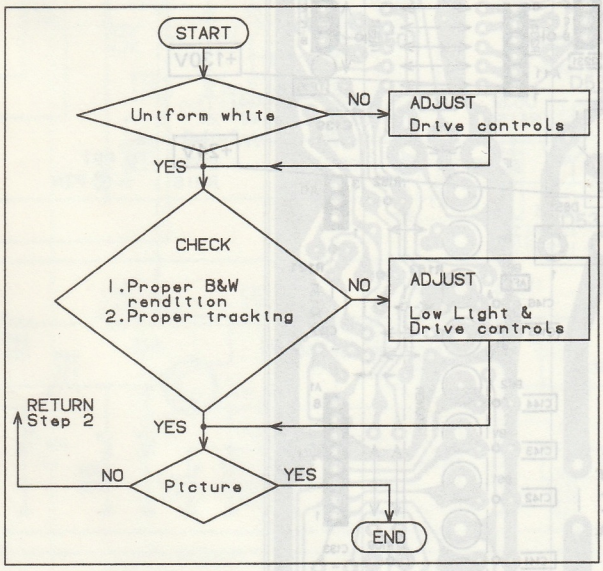
3. Set Service Switch to the SERVICE position.
4. Slowly turn the screen control clockwise to the point where a green beam just appears.



5. Turn R-,B-low light controls clockwise, from the setting position at the step 2, so as to get a white horizontal line on the picture tube.



6. Reset Service Switch to the NORMAL position.
7. Confirm the white balance according to following flow chart.



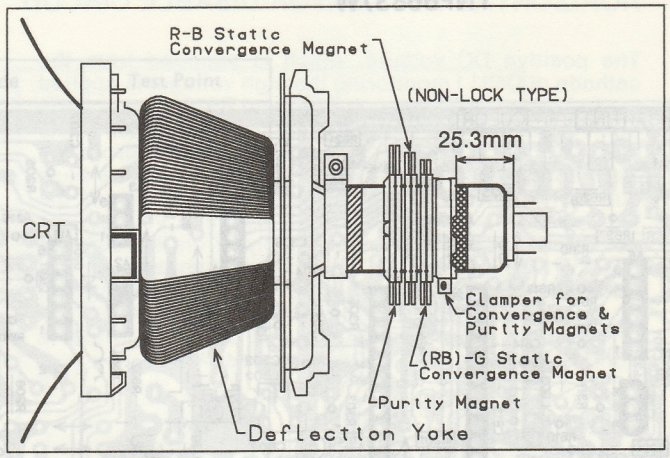


Figure 8

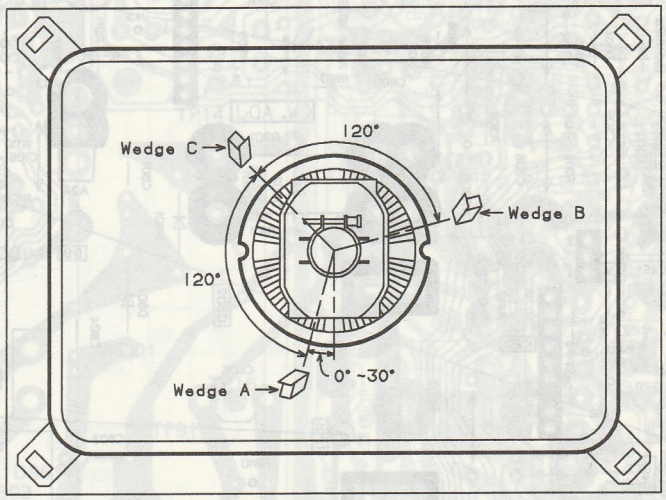


Figure 9

Notes:

1. Wedge A shown in figure 9 should be fixed within a range of 0° ~30° to the left of the vertical line as shown.
2. After inserting wedge A, insert wedges B and C . The wedges should be set 120° apart from each other.
3. Be certain that the three wedges are firmly fixed and the Deflection Yoke is tightly clamped in place. Otherwise the Deflection Yoke may shift its position and cause a loss of convergence and purity.

CIRCUIT EXPLANATION

HORIZONTAL OSCILLATOR DISABLE CIRCUIT

The positive DC voltage, which is supplied from the cathode of D531 f monitoring the high voltage, is applied to the base of Q531 through R531 and R532. The voltage at the emitter of Q531 is regulated by Zener Diode D533. Under normal conditions, the voltage applied across the base and emitter of Q531 is not sufficient to cause base current to flow and hoids the transistor cut off. If the high voltage increases over the specified voltage, the positive DC voltage which is supplied from the cathode of D531 also increases. The increased voltage applied to the base of Q531 causes base current to flow through Zener Diode D533, Consequentry collector current begins to flow and the voltage at the collector, which is connected to the base of Q532, decreases.

This causes Q532 base current, and Q532 collector current begins to flow, and the voltage at the collector, which is connected to the base of Q533, increase. Therefore Q533 turn on. Then it causes the horizontal oscillator frequency to increase, loss of horizontal synchronization, and lowering of the high voltage. R538 affects slightly to aid operation of horizontal oscillator disable circuit when the beam current increases and potential at the junction of R559 decreases.

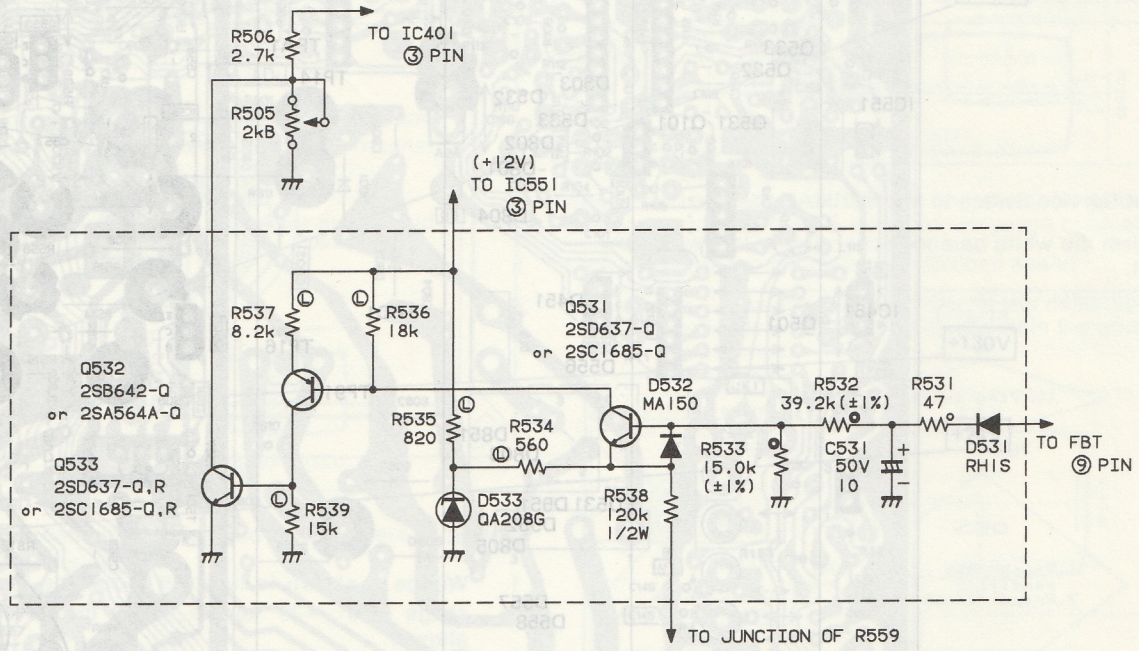


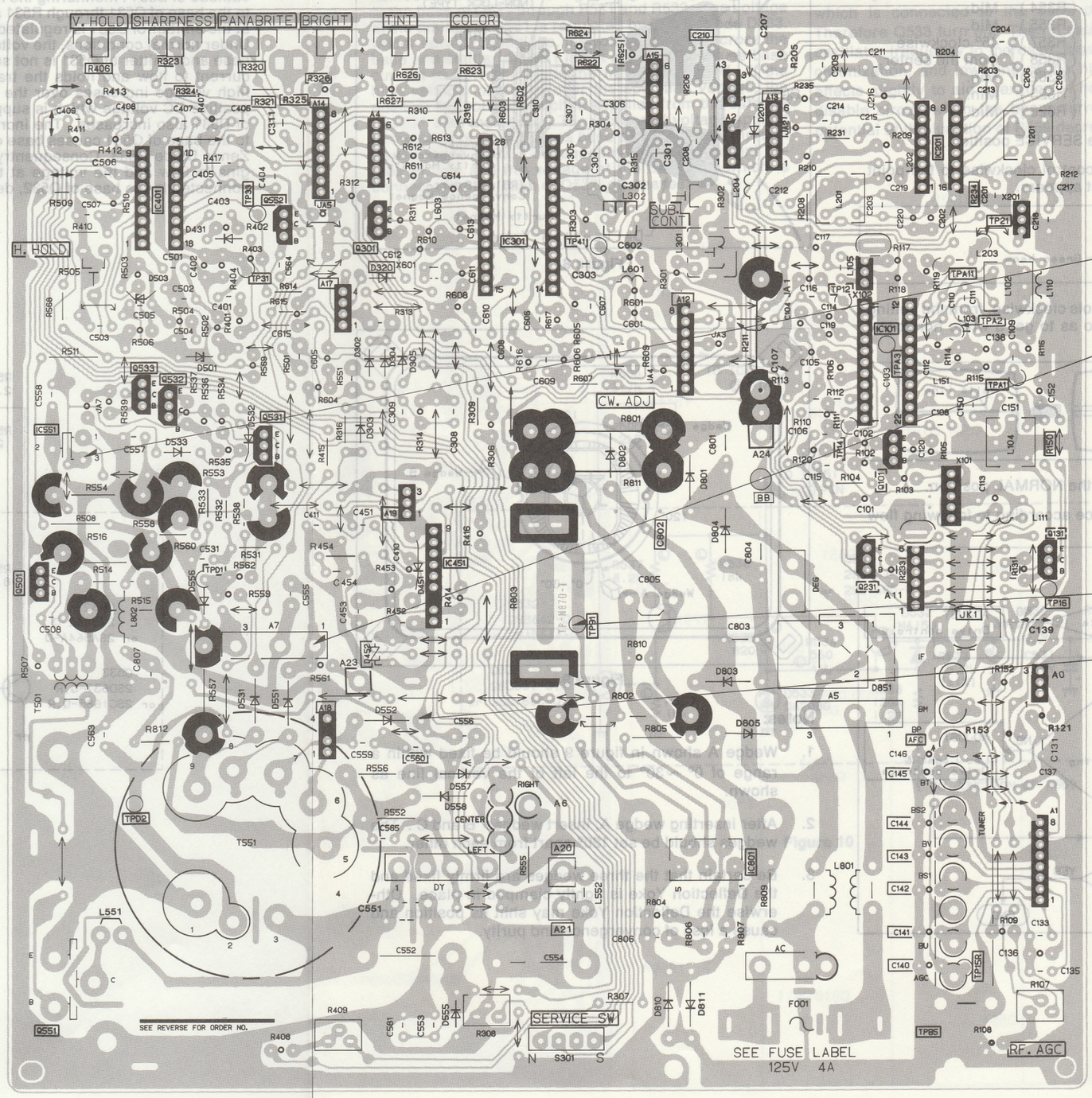
Figure 10

CONDUCTOR VIEWS

A-BOARD

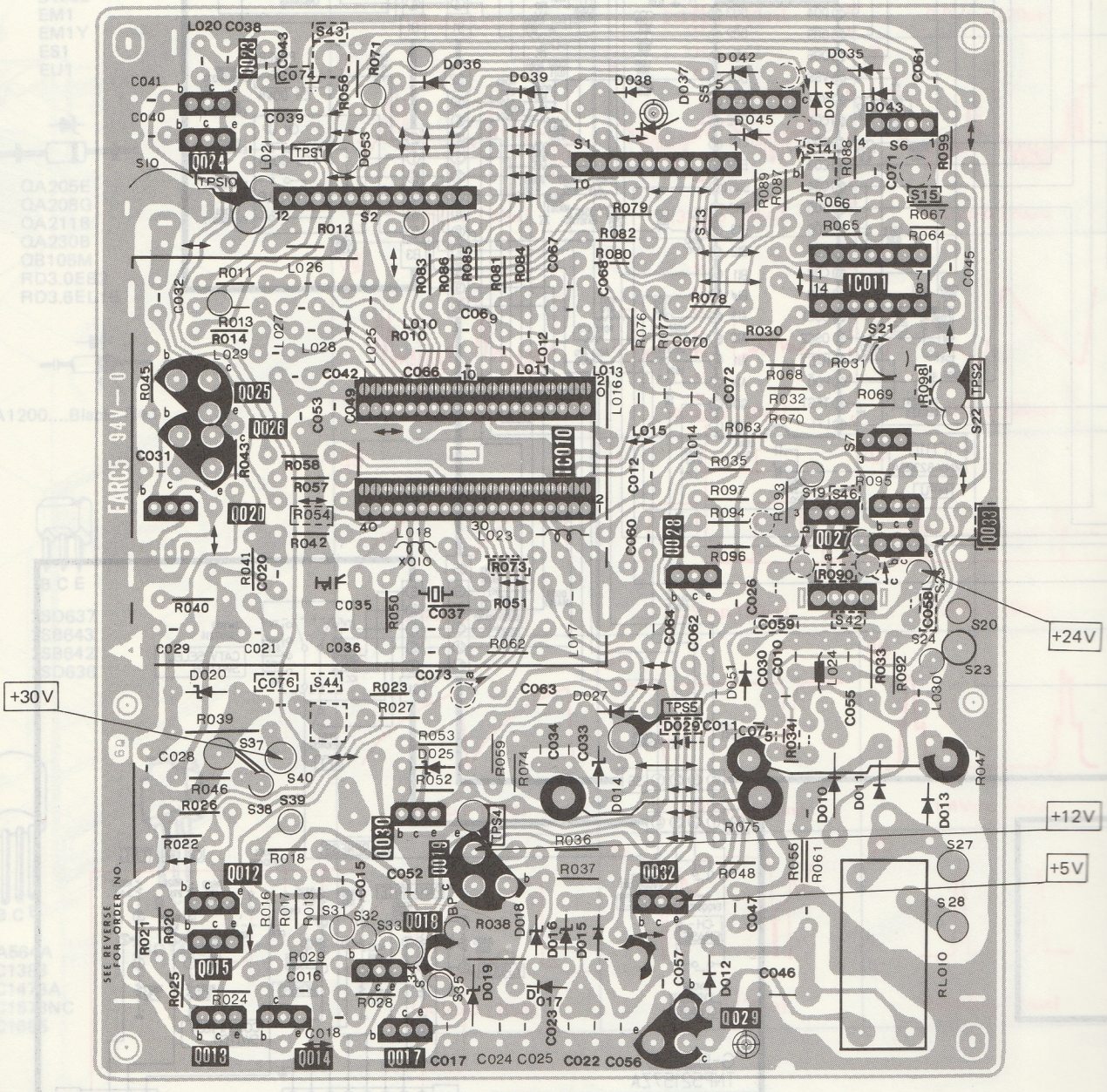
TNP66837W

I.C.	Transistor	Diode	Test Point
IC201			TP33
IC401	Q552 Q301		TP21
IC301		D431	TP41
		D503	TP31
			TP12
IC101		D305	TPA2
		D501 D302 D304	TPA3
	Q533		TPA1
	Q532	D303	TP14
IC551		D532	
	Q531 Q101	D533	
		D802	
		D801	
		D804	
IC451	Q501	D451	TPD1
			TP16
		D556	
			TP91
		D851	
		D803	
		D531 D551	
		D552	
		D805	
		D557	
		D558	
			TPD2
IC801			
			TP15R
		D810 D811	
	Q551		



S-BOARD
TNP52043TQ

I.C.	IC010 IC011
Transistor	Q023 Q024 Q025 Q026 Q020 Q012 Q015 Q013 Q014 Q030 Q018 Q019 Q017 Q028 Q032 Q029 Q027
Diode	D020 D036 D039 D038 D042 D044 D035 D037 D045 D043 D025 D018 D016 D015 D014 D027 D051 D010 D019 D017 D012 D011 D013
Test Point	TPS10 TPS1 TPS4 TPS5 TPS2



SCHEMATIC DIAGRAM

U/V TUNER TNV56461G2

TERMINAL SUPPLY VOLTAGE

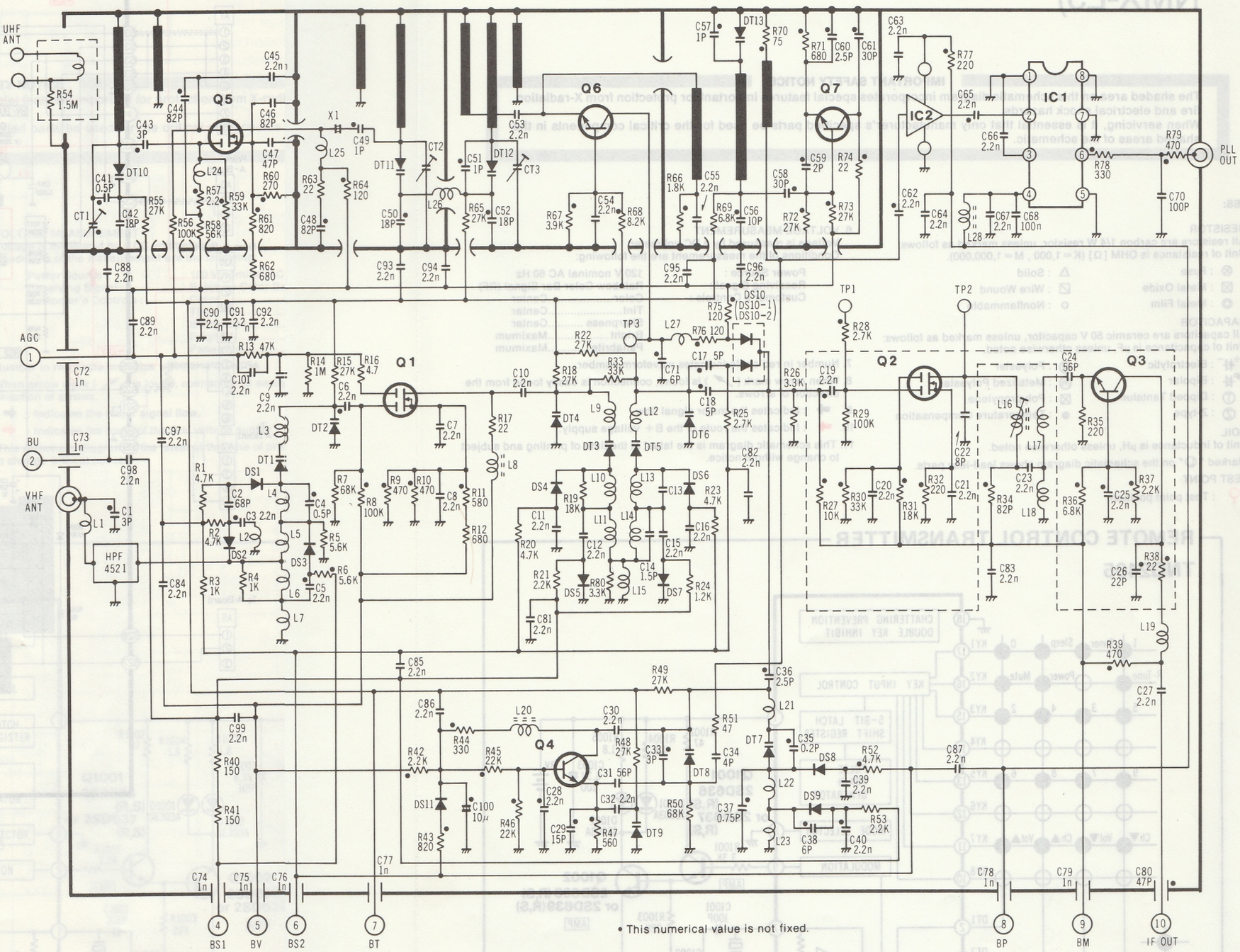
Terminal No.	Terminal Name	Supply Voltage
1	AGC	+7.5V Gain MAX.
2	BU	+ 12V
3	———	———
4	BS1	± 12V
5	BV	+ 12V
6	BS2	± 12V
7	BT	0.4V ~ 28V
8	BP	5V
9	BM	+ 12V
10	IF OUT	———

SYMBOL

Symbol	Symbol No.	Semiconductor
	DT1, DT3	MA329, TX287, 1T33
	DT5, DT7	1SV161S, 1SV177, 1SV167
	DT2, DT4, DT6	1SV164, 1SV165, MA334
	DT8 ~ DT13	1SV153, 1T32
	DS1 ~ DS10	MA72, RLS135, MA859, MA860, DLP238, HSK110, 1SS241, MC804, MA190WK, MA151WK, MC2838, 1S2837, MA194
	DS11	MA221, RLS73, HSK121, RLS72
	Q1, Q2	3SK132, 3SK139, 3SK137, 3SK153, 3SK131, 3SK151, 3SK162, 3SK144, 3SK136
	Q3	2SC2757, 2SC2404, 2SC2733, 2SC2620, 2SC2480, 2SC2735, 2SC2223, 2SC3125, 2SC3123
	Q4, Q7	2SC3545, 2SC3130, 2SC2736, 2SC2759, 2SC2734, 2SC2733, 2SC2757, 2SC2735
	Q5	3SK143, 3SK146, 3SK138, 3SK134, 3SK141, 3SK140
	Q8	2SC3077, 2SC3120, 2SC2758, 2SC2732, 2SC3130
	IC2 or Q8	μPC1651G, 2SK378, 2SC2671, 2SC3355, 2SC3358
	IC1	M54462

BS1, BS2 SUPPLY VOLTAGE

	ch. 2 ~ 6	ch. A-5 ~ 13	ch. J ~ EEE	UHF
BS1	–12V	+ 12V	+ 12V	+ 12V
BS2	–12V	– 12V	+ 12V	– 12V



• This numerical value is not fixed.

SYMBOL NAME

PIN JACK · FEED THRU · TEST POINT · FERRITE BEED

SCHEMATIC DIAGRAM FOR MODELS CTG-1349R/CTG-1362R(CHASSIS NO. NMX-L5)

IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from X-radiation, fire and electrical shock hazards.
When servicing, it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

NOTES:

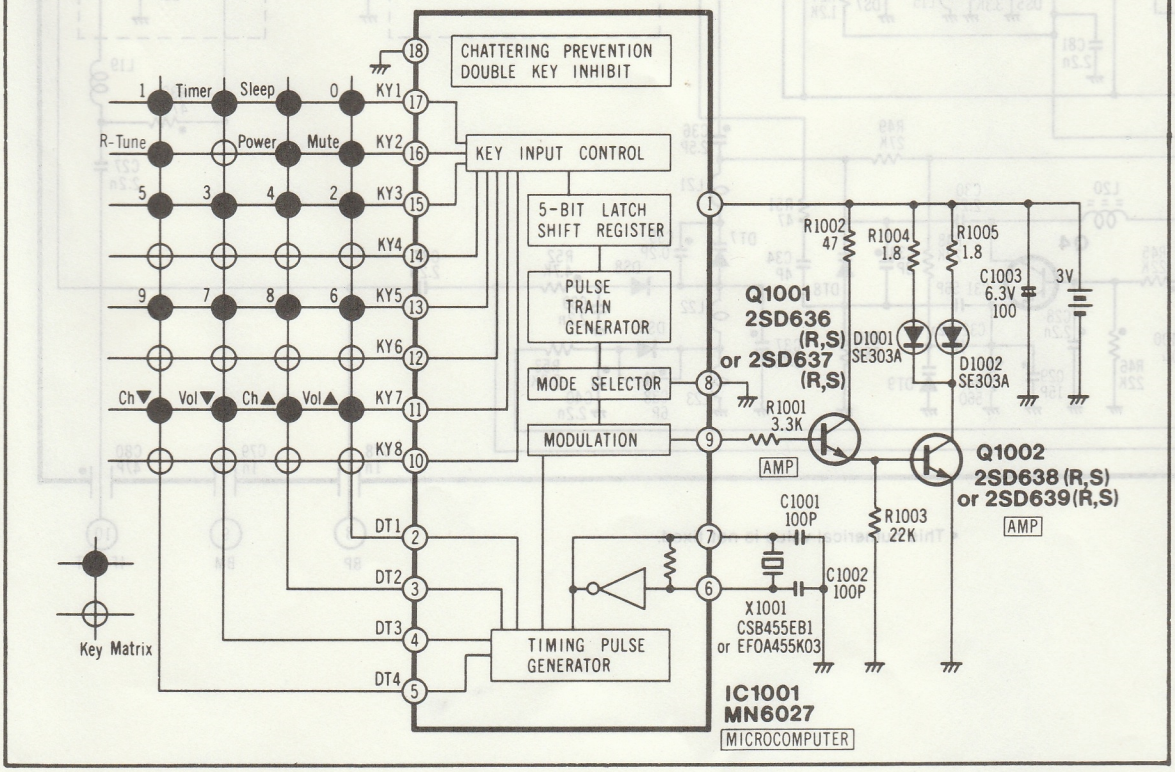
1. RESISTOR
   All resistors are carbon 1/4 W resistor, unless marked as follows:
   Unit of resistance is OHM [Ω] (K = 1,000 , M = 1,000,000).
   - ⊗ : Fuse
   - ⊠ : Metal Oxide
   - ◎ : Metal Film
   - △ : Solid
   - ⊿ : Wire Wound
   - o : Nonflammable
2. CAPACITOR
   All capacitors are ceramic 50 V capacitor, unless marked as follows:
   Unit of capacitance is μF, unless otherwise noted.
   - ⁺⫫⁻ : Electrolytic
   - NP⫫ : Bipolar
   - Ⓣ : Dipped Tantalum
   - Ⓩ : Z-type
   - Ⓜ : Polyester
   - ⓜ : Metalized Polyester
   - ⊠ : Polypropylene
   - ● : Temperature Compensation
3. COIL
   Unit of inductance is μH, unless otherwise noted.
4. Marked "Ⓛ" on the schematic diagram shows lead-less parts.
5. TEST POINT
   ⚲ : Test point position.
6. VOLTAGE MEASUREMENT
   Voltage is measured by a DC voltmeter.
   Conditions of the measurement are the following:

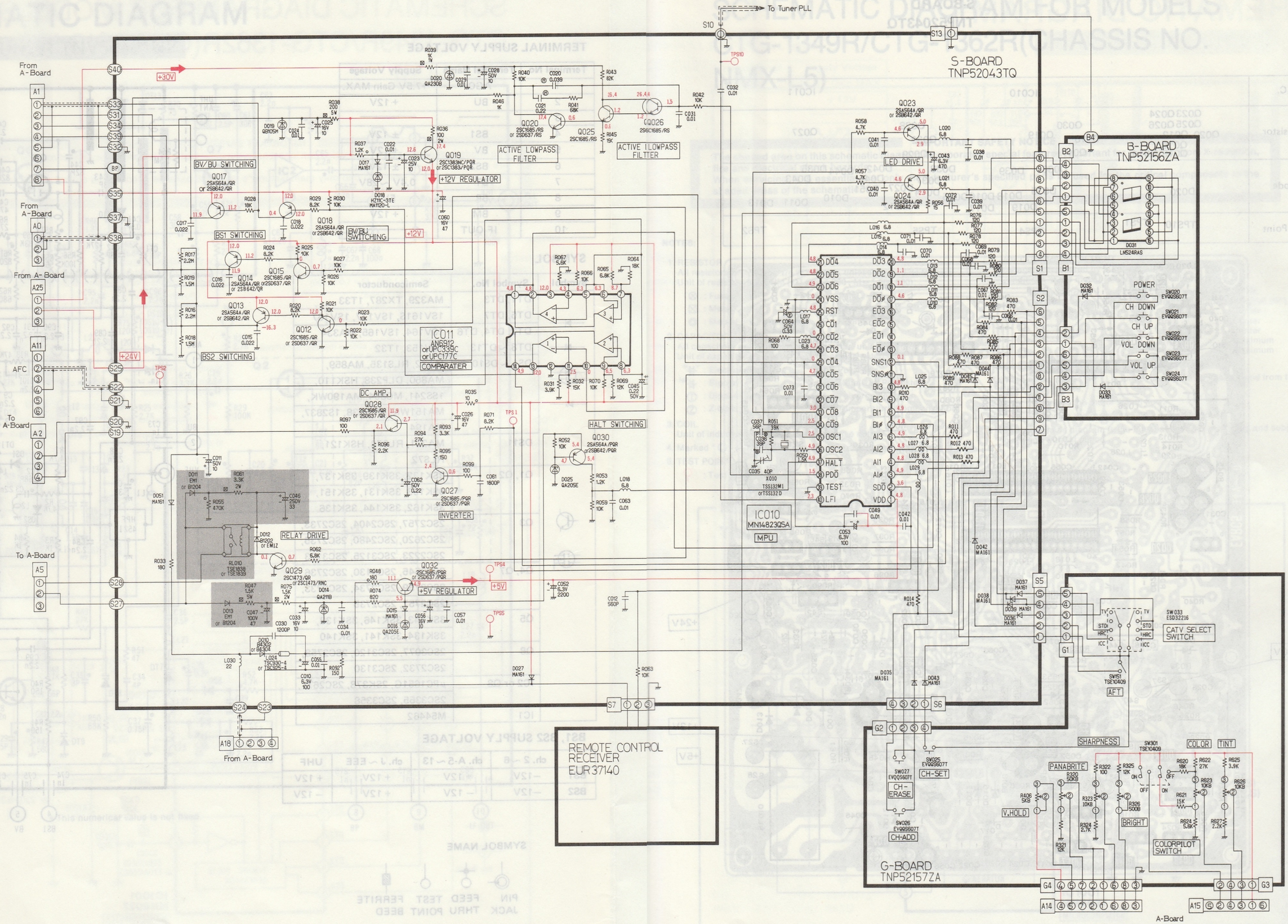
Power Source :	120 V nominal AC 60 Hz
Receiving Signal :	Rainbow Color Bar Signal (RF)
Customer's Controls :	Color .....Center
	Tint .....Center
	Sharpness .....Center
	Bright .....Maximum
	Panabrite .....Maximum

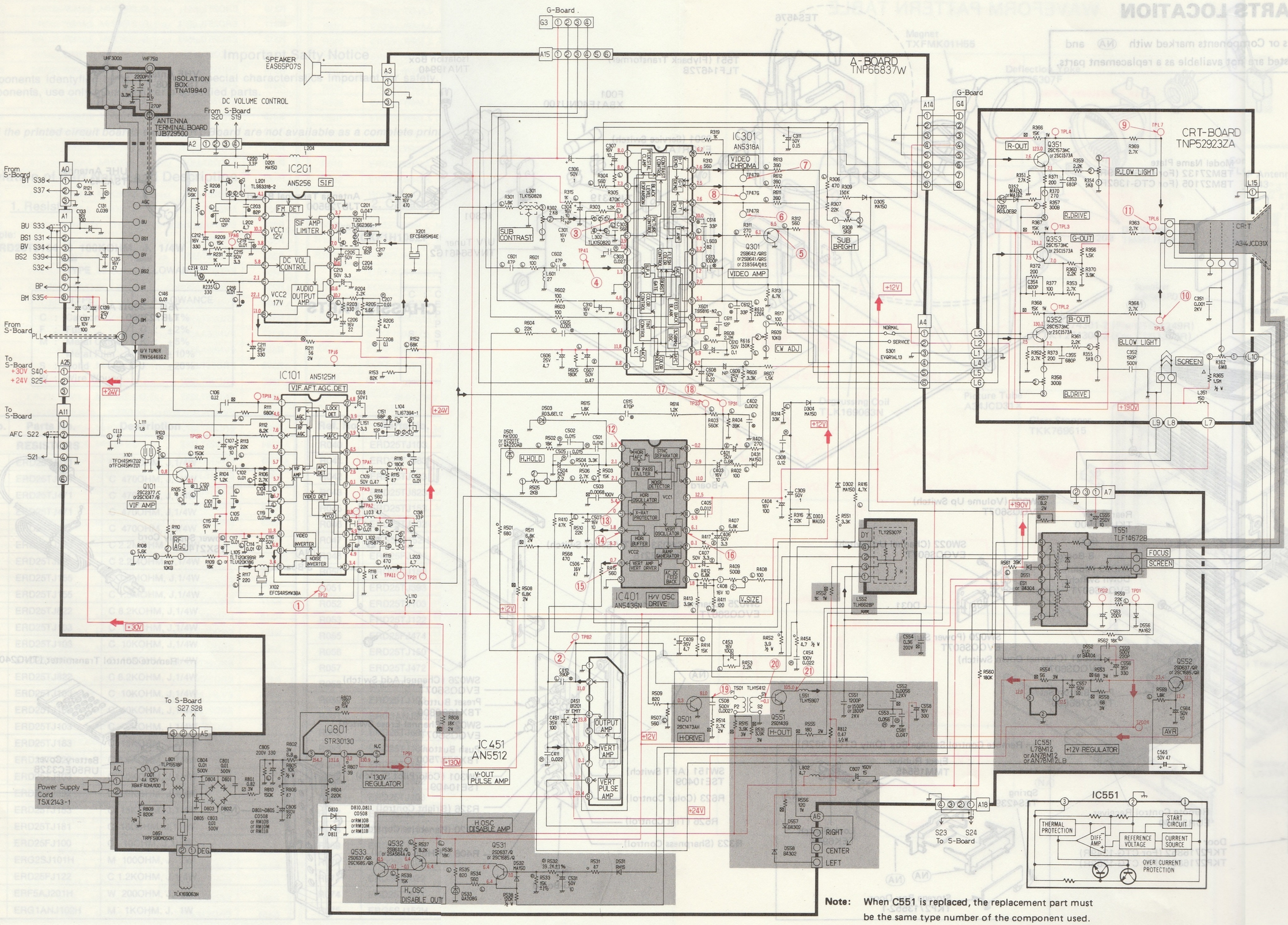
7. Number in red circle indicates waveform number.
8. When arrow mark (↗) is found, connection is easily found from the direction of arrows.
9. ➡ : Indicates the major signal flow.
10. ➡ : Indicates the route of the B+ voltage supply.
11. This schematic diagram is the latest at the time of printing and subject to change without notice.

REMOTE CONTROL TRANSMITTER

TNQ2405

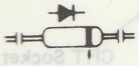



To Tuner PLL
S10
S13
TPS10
S-BOARD
TNP52043TQ
From A-Board
A1
A0
A25
A11
AFC
To A-Board
A2
A5
S40
S33
S31
S34
S39
S32
BP
S35
S37
S38
S25
S22
S21
S20
S19
S28
S27
S24
S23
A18
From A-Board
+30V
+24V
+12V
+5V
BV/BU SWITCHING
+12V REGULATOR
BS1 SWITCHING
BS2 SWITCHING
BV/BU SWITCHING
ACTIVE LOWPASS FILTER
ACTIVE HIGHPASS FILTTER
COMPARATER
DC AMP.
HALT SWITCHING
INVERTER
RELAY DRIVE
+5V REGULATOR
LED DRIVE
MPU
IC010 MN14823QSA
IC011 AN612 or UPC339C or UPC177C
REMOTE CONTROL RECEIVER EUR37140
B-BOARD
TNP52156ZA
POWER
CH DOWN
CH UP
VOL DOWN
VOL UP
CATV SELECT SWITCH
AFT
SHARPNESS
COLOR
TINT
PANABRITE
V.HOLD
BRIGHT
COLORPILOT SWITCH
CH-SET
CH-ERASE
CH-ADD
G-BOARD
TNP52157ZA
A14
A15
A-Board



Note: When C551 is replaced, the replacement part must be the same type number of the component used.

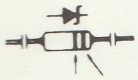
WAVEFORM PATTERN TABLE



MA150.....White
MA161.....Green
MA162.....Purple
MA165.....White

B1201
B1202
B4302
EM1
EM1Y
ES1
EU1

QA205E
QA208G
QA211B
QA230B
QB105M
RD3.0EB2
RD3.6EL1E

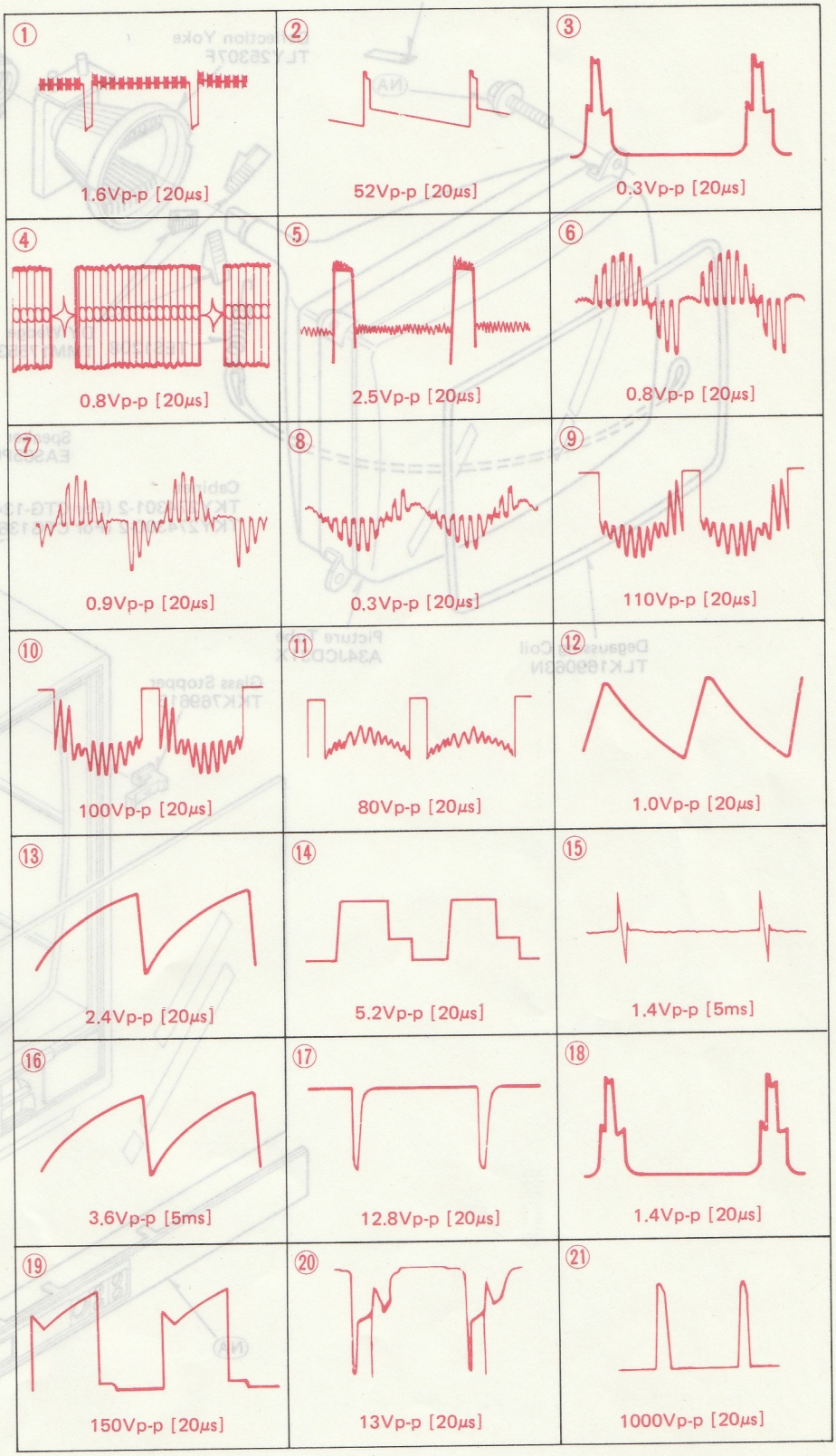


MA1200....Black Red

2SD637
2SB643
2SB642
2SD636

2SA564A
2SC1383
2SC1473A
2SC1573NC
2SC1685

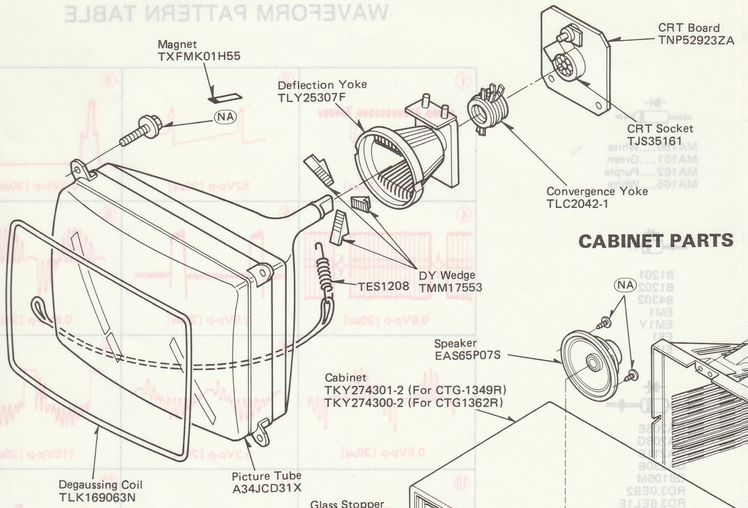
2SD1439



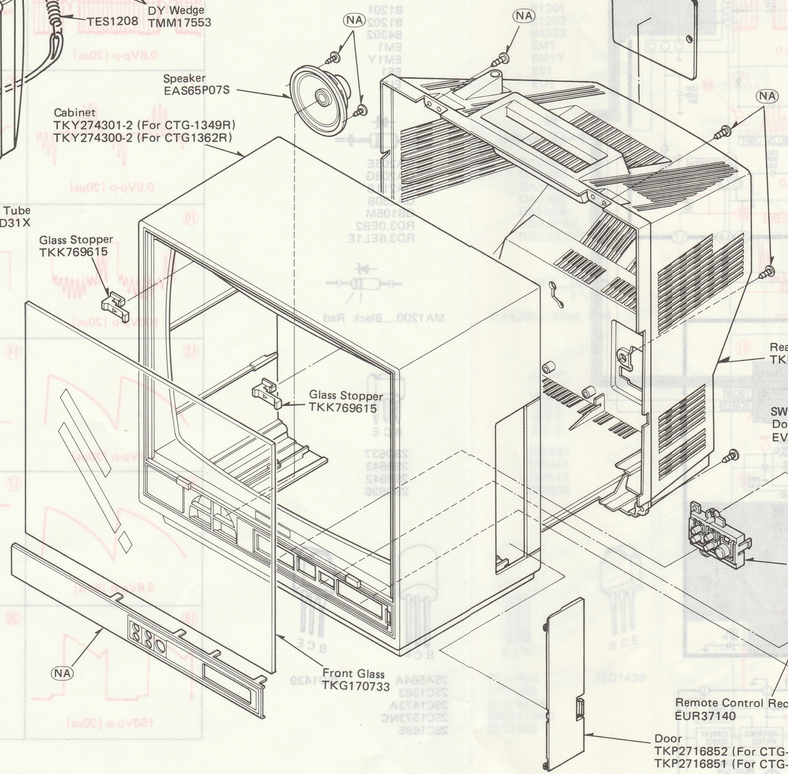
CTG-1349R/CTG-1362R CTG-1349R/CTG-1362R

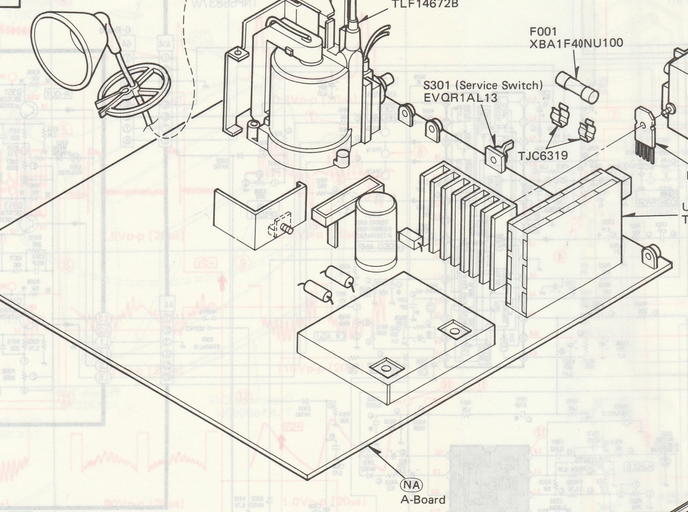
PARTS LOCATION

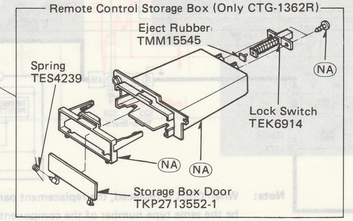
NOTE: Parts or Components marked with (NA) and unlisted are not available as a replacement parts.



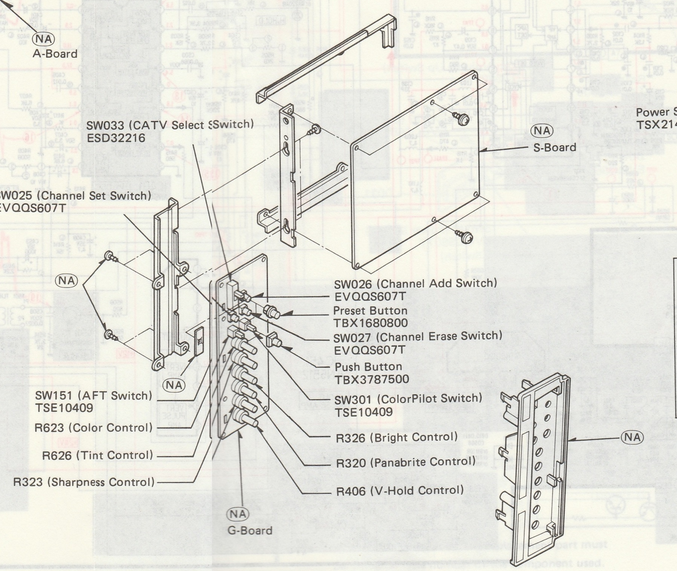
CABINET PARTS

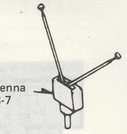


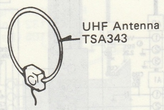


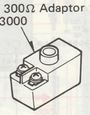


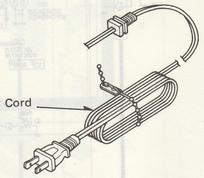
CHASSIS PARTS

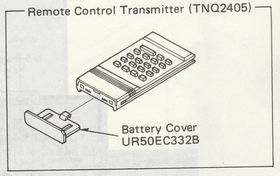












REPLACEMENT PARTS LIST

Important Safty Notice

Components identyfied by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Note: *All the printed circuit boards except CRT-Board are not available as a complete printed circuit board.*

Abbreviation of Part Name and Description

1. Resistor

Example:

ERD25TJ104 C 100KOHM, J, 1/4W

TYPE ALLOWANCE

TYPE	ALLOWANCE
C : Carbon	F : ±1%
F : Fuse	G : ±2%
M : Metal Oxide	K : ±5%
Metal Film	M : ±10%
S : Solid	J : ±20%
W : Wire Wound	

2. Capacitor

Example:

ECKF1H103ZF C 0.01PF, Z, 50V

TYPE ALLOWANCE

TYPE	ALLOWANCE
C : Ceramic	C : ±0.25pF
E : Electrolytic	D : ±0.5pF
P : Polyester	F : ±1pF
Polypropylene	J : ±5%
S : Styrol	K : ±10%
T : Tantalum	L : ±15%
	M : ±20%
	P : +100%, -0%
	Z : +80%, -20%

Ref. No.	Parts No.	Description
	RESISTORS	
R010	ERD25TJ471	C 470OHM, J,1/4W
R011	ERD25TJ471	C 470OHM, J,1/4W
R012	ERD25TJ471	C 470OHM, J,1/4W
R013	ERD25TJ471	C 470OHM, J,1/4W
R014	ERD25TJ471	C 470OHM, J,1/4W
R016	ERD25TJ225	C 2.2MOHM, J,1/4W
R017	ERD25TJ225	C 2.2MOHM, J,1/4W
R018	ERD25TJ155	C 1.5MOHM, J,1/4W
R019	ERD25TJ155	C 1.5MOHM, J,1/4W
R020	ERD25TJ822	C 8.2KOHM, J,1/4W
R021	ERD25TJ103	C 10KOHM, J,1/4W
R022	ERD25TJ103	C 10KOHM, J,1/4W
R023	ERD25TJ103	C 10KOHM, J,1/4W
R024	ERD25TJ822	C 8.2KOHM, J,1/4W
R025	ERD25TJ103	C 10KOHM, J,1/4W
R026	ERD25TJ103	C 10KOHM, J,1/4W
R027	ERD25TJ103	C 10KOHM, J,1/4W
R028	ERD25TJ183	C 18KOHM, J,1/4W
R029	ERD25TJ822	C 8.2KOHM, J,1/4W
R030	ERD25TJ103	C 10KOHM, J,1/4W
R031	ERD25TJ392	C 3.9KOHM, J,1/4W
R032	ERD25TJ153	C 15KOHM, J,1/4W
R033	ERD25TJ181	C 180OHM, J,1/4W
R035	ERD25FJ100	C 10OHM, J,1/4W
R036	ERG2SJ101H	M 100OHM, J, 2W
R037	ERD25FJ122	C 1.2KOHM, J,1/4W
R038	ERF5AJ201H	W 200OHM, J, 5W
R039	ERG1ANJ102H	M 1KOHM, J, 1W

Ref. No.	Parts No.	Description	
R040	ERD25TJ103	C 10KOHM, J,1/4W	
R041	ERD25TJ683	C 68KOHM, J,1/4W	
R042	ERD25TJ103	C 10KOHM, J,1/4W	
R043	ERD25TJ823	C 82KOHM, J,1/4W	
R045	ERD25TJ153	C 15KOHM, J,1/4W	
R046	ERD25TJ102	C 1KOHM, J,1/4W	
R047	ERG5SJ152H	M 1.5KOHM, J, 5W	⚠
R048	ERD25FJ181	C 180OHM, J,1/4W	
R050	ERD25TJ152	C 1.5KOHM, J,1/4W	
R051	ERD25TJ393	C 39KOHM, J,1/4W	
R052	ERD25TJ103	C 10KOHM, J,1/4W	
R053	ERD25TJ122	C 1.2KOHM, J,1/4W	
R055	ERD25FJ474	C 470KOHM, J,1/4W	⚠
R056	ERD25TJ150	C 15OHM, J,1/4W	
R057	ERD25TJ472	C 4.7KOHM, J,1/4W	
R058	ERD25TJ472	C 4.7KOHM, J,1/4W	
R059	ERD25TJ103	C 10KOHM, J,1/4W	
R061	ERG2ANJ332H	M 3.3KOHM, J, 2W	⚠
R062	ERD25TJ682	C 6.8KOHM, J,1/4W	
R063	ERD25TJ103	C 10KOHM, J,1/4W	
R064	ERD25TJ183	C 18KOHM, J,1/4W	
R065	ERD25TJ682	C 6.8KOHM, J,1/4W	
R066	ERD25TJ103	C 10KOHM, J,1/4W	
R067	ERD25TJ562	C 5.6KOHM, J,1/4W	
R068	ERD25TJ101	C 100OHM, J,1/4W	
R069	ERD25TJ123	C 12KOHM, J,1/4W	
R070	ERD25TJ103	C 10KOHM, J,1/4W	
R071	ERD25TJ822	C 8.2KOHM, J,1/4W	
R074	ERD25TJ821	C 820OHM, J,1/4W	
R075	ERG5SJ152H	M 1.5KOHM, J, 5W	

Ref. No.	Parts No.	Description
R076	ERD25TJ121	C 120OHM, J,1/4W
R077	ERD25TJ121	C 120OHM, J,1/4W
R078	ERD25TJ121	C 120OHM, J,1/4W
R079	ERD25TJ121	C 120OHM, J,1/4W
R080	ERD25TJ121	C 120OHM, J,1/4W
R081	ERD25TJ121	C 120OHM, J,1/4W
R082	ERD25TJ121	C 120OHM, J,1/4W
R083	ERD25TJ471	C 470OHM, J,1/4W
R084	ERD25TJ471	C 470OHM, J,1/4W
R085	ERD25TJ471	C 470OHM, J,1/4W
R086	ERD25TJ471	C 470OHM, J,1/4W
R087	ERD25TJ471	C 470OHM, J,1/4W
R088	ERD25TJ471	C 470OHM, J,1/4W
R089	ERD25TJ471	C 470OHM, J,1/4W
R092	ERD25TJ151	C 150OHM, J,1/4W
R093	ERD25TJ332	C 3.3KOHM, J,1/4W
R094	ERD25TJ273	C 27KOHM, J,1/4W
R095	ERD25TJ151	C 150OHM, J,1/4W
R096	ERD25TJ222	C 2.2KOHM, J,1/4W
R097	ERD25TJ101	C 100OHM, J,1/4W
R099	ERD25TJ101	C 100OHM, J,1/4W
R102	ERD25TLJ154	C 150KOHM, J,1/4W
R103	ERD25TLJ151	C 150OHM, J,1/4W
R104	ERD25TJ122	C 1.2KOHM, J,1/4W
R105	ERD25TLJ180	C 18OHM, J,1/4W
R106	ERD25TLJ272	C 2.7KOHM, J,1/4W
R107	EVN74AA00B14	RF AGC 10KOHMB
R108	ERD25TLJ562	C 5.6KOHM, J,1/4W
R109	ERD25TLJ183	C 18KOHM, J,1/4W
R110	ERD25TJ102	C 1KOHM, J,1/4W
R111	ERD25TLJ684	C 680KOHM, J,1/4W
R112	ERD25TJ822	C 8.2KOHM, J,1/4W
R113	ERD25TLJ223	C 22KOHM, J,1/4W
R114	ERD25TLJ561	C 560OHM, J,1/4W
R115	ERD25TLJ470	C 47OHM, J,1/4W
R116	ERD25TLJ184	C 180KOHM, J,1/4W
R117	ERD25TLJ221	C 220OHM, J,1/4W
R118	ERD25TLJ102	C 1KOHM, J,1/4W
R119	ERD25TLJ471	C 470OHM, J,1/4W
R121	ERD25TLJ222	C 2.2KOHM, J,1/4W
R152	ERD25TLJ683	C 68K OHM, J,1/4W
R153	ERD25TJ823	C 82KOHM, J,1/4W
R203	ERD25TLJ331	C 330OHM, J,1/4W
R204	ERD25TLJ222	C 2.2KOHM, J,1/4W
R205	ERD25TLJ562	C 5.6KOHM, J,1/4W
R206	ERD25FJ4R7	C 4.7OHM, J,1/4W
R208	ERD25FJ470	C 47OHM, J,1/4W
R209	ERD25TLJ153	C 15KOHM, J,1/4W
R210	ERD25TLJ563	C 56KOHM, J,1/4W
R211	ERQ2CJP560S	F 56OHM, J, 2W
R231	ERD25TJ102	C 1KOHM, J,1/4W
R235	ERD25TLJ331	C 330OHM, J,1/4W
R301	ERD25TLJ182	C 1.8KOHM, J,1/4W
R302	EVN65AA00B23	SUB CONTRAST 2KOHMB
R303	ERD25TLJ122	C 1.2KOHM, J,1/4W
R304	ERD25TLJ561	C 560OHM, J,1/4W
R305	ERD25TLJ474	C 470KOHM, J,1/4W
R306	ERD25TLJ471	C 470OHM, J,1/4W
R307	ERD25TJ223	C 22KOHM, J,1/4W
R308	EVN74AA00B53	SUB BRIGHT 5KOHMB

Ref. No.	Parts No.	Description
R309	ERD25TJ154	C 150KOHM, J,1/4W
R310	ERD25TJ561	C 560OHM, J,1/4W
R311	ERD25TLJ271	C 270OHM, J,1/4W
R312	ERD25TLJ561	C 560OHM, J,1/4W
R313	ERD25FJ472	C 4.7KOHM, J,1/4W
R314	ERD25TLJ333	C 33KOHM, J,1/4W
R315	ERD25TLJ102	C 1KOHM, J,1/4W
R316	ERD25TJ223	C 22KOHM, J,1/4W
R319	ERD25TJ102	C 1KOHM, J,1/4W
R320	EVJFLAE01B54	PANABRITE 50KOHMB
R321	ERD25TJ123	C 12KOHM, J,1/4W
R322	ERD25TJ101	C 100OHM, J,1/4W
R323	EVJFLAE01B14	SHARPNESS 10KOHMB
R324	ERD25TJ272	C 2.7KOHM, J,1/4W
R325	ERD25TJ123	C 12KOHM, J,1/4W
R326	EVJFMAE01B52	BRIGHT 500OHMB
R351	ERD25TJ272	C 2.7KOHM, J,1/4W
R352	ERD25TJ272	C 2.7KOHM, J,1/4W
R353	ERD25TJ272	C 2.7KOHM, J,1/4W
R354	EVN65AA00B53	R-LOW LIGHT 5KOHM
R355	EVN65AA00B53	B-LOW LIGHT 5KOHM
R356	ERD25TJ152	C 1.5KOHM, J,1/4W
R357	EVN65AA00B32	R-DRIVE 300OHMB
R358	EVN65AA00B32	B-DRIVE 300OHMB
R359	ERD25TJ222	C 2.2KOHM, J,1/4W
R360	ERD25TJ222	C 2.2KOHM, J,1/4W
R361	ERD25TJ222	C 2.2KOHM, J,1/4W
R362	EVME6U10KB66	SCREEN 6MOHMB
R363	ERD25TJ272	C 2.7KOHM, J,1/4W
R364	ERD25TJ272	C 2.7KOHM, J,1/4W
R365	ERC12GK155	S 1.5MOHM, K,1/2W
R366	ERG1SJ153P	M 15KOHM, J, 1W
R367	ERG1SJ153P	M 15KOHM, J, 1W
R368	ERG1SJ153P	M 15KOHM, J, 1W
R369	ERD25TJ272	C 2.7KOHM, J,1/4W
R370	ERD25TJ392	C 3.9KOHM, J,1/4W
R371	ERD25TJ201	C 200OHM, J,1/4W
R372	ERD25TJ201	C 200OHM, J,1/4W
R373	ERD25TJ201	C 200OHM, J,1/4W
R377	ERD25TJ101	C 100OHM, J,1/4W
R378	ERD25TJ271	C 270OHM, J,1/4W
R401	ERD25TLJ271	C 270OHM, J,1/4W
R402	ERD25TLJ101	C 100OHM, J,1/4W
R403	ERD25TLJ564	C 560KOHM, J,1/4W
R404	ERD25TLJ393	C 39KOHM, J,1/4W
R406	EVJFLAE01B53	V-HOLD 5KOHMB
R407	ERD25TLJ682	C 6.8KOHM, J,1/4W
R408	ERD25TLJ101	C 100OHM, J,1/4W
R409	EVN74AA00B52	V-SIZE 500OHMB
R410	ERD25TJ473	C 47KOHM, J,1/4W
R411	ERD25TLJ121	C 120OHM, J,1/4W
R412	ERD25TLJ682	C 6.8KOHM, J,1/4W
R413	ERD25TLJ392	C 3.9KOHM, J,1/4W
R414	ERD25TLJ153	C 15KOHM, J,1/4W
R415	ERD25TJ561	C 560OHM, J,1/4W
R416	ERD25TLJ472	C 4.7KOHM, J,1/4W
R417	ERD25TJ102	C 1KOHM, J,1/4W
R452	ERDS1FJ3R9	C 3.9OHM, J,1/2W
R453	ERD25TLJ222	C 2.2KOHM, J,1/4W
R454	ERDS1FJ4R7	C 4.7OHM, J,1/2W

Ref. No.	Parts No.	Description	
R501	ERD25FJ681	C 680OHM, J,1/4W	
R502	ERD25TLJ183	C 18KOHM, J,1/4W	
R503	ERD25TLJ153	C 15KOHM, J,1/4W	
R504	ERD25TLJ332	C 3.3KOHM, J,1/4W	
R505	EVN65AA00B23	H-HOLD 2KOHMB	
R506	ERD25TLJ272	C 2.7KOHM, J,1/4W	
R507	ERD25TLJ561	C 560OHM, J,1/4W	
R508	ERG2SJ682H	M 6.8KOHM, J, 2W	
R509	ERD25TJ821	C 820OHM, J,1/4W	
R510	ERD25TLJ223	C 22KOHM, J,1/4W	
R511	ERG2SJ682H	M 6.8KOHM, J, 2W	
R514	ERG2SJ272H	M 2.7KOHM, J, 2W	
R515	ERG3SJ392H	M 3.9KOHM, J, 3W	⚠
R516	ERG3SJ392H	M 3.9KOHM, J, 3W	⚠
R531	ERD25FJ470	C 47OHM, J,1/4W	⚠
R532	ERO25CKF3922	C 39.2KOHM, F,1/4W	⚠
R533	ERO25CKF1502	C 15.0KOHM, F,1/4W	⚠
R534	ERD25TLJ561	C 560OHM, J,1/4W	⚠
R535	ERD25TLJ821	C 820OHM, J,1/4W	⚠
R536	ERD25TLJ183	C 18KOHM, J,1/4W	⚠
R537	ERD25TLJ822	C 8.2KOHM, J,1/4W	⚠
R538	ERDS1TJ124	C 120KOHM, J,1/2W	⚠
R539	ERD25TLJ153	C 15KOHM, J,1/4W	⚠
R551	ERD25FJ332	C 3.3KOHM, J,1/4W	
R552	ERG1ANJ102H	M 1KOHM, J, 1W	⚠
R553	ERG3SJ680H	M 68OHM, J, 3W	⚠
R554	ERG3SJ560H	M 56OHM, J, 3W	⚠
R555	ERG2SJ181H	M 180OHM, J, 2W	⚠
R556	ERG1ANJ121H	M 120OHM, J, 1W	⚠
R557	ERQ2CJP8R2S	F 8.2OHM, J, 2W	⚠
R558	ERG3SJ680H	M 68OHM, J, 3W	⚠
R559	ERD25TLJ223	C 22KOHM, J,1/4W	
R560	ERD25TJ184	C 180KOHM, J,1/4W	
R561	ERD25TLJ393	C 39KOHM, J,1/4W	
R562	ERD25TLJ183	C 18KOHM, J,1/4W	
R568	ERD25TJ471	C 470OHM, J,1/4W	
R569	ERD25TLJ182	C 1.8KOHM, J,1/4W	⚠
R601	ERD25TLJ101	C 100OHM, J,1/4W	
R602	ERD25TJ101	C 100OHM, J,1/4W	
R603	ERD25TJ101	C 100OHM, J,1/4W	
R604	ERD25TLJ223	C 22KOHM, J,1/4W	
R605	ERD25TLJ184	C 180KOHM, J,1/4W	
R606	ERD25TLJ332	C 3.3KOHM, J,1/4W	
R607	ERD25TJ152	C 1.5KOHM, J,1/4W	
R608	ERD25TLJ225	C 2.2MOHM, J,1/4W	
R609	EVN65AA00B14	CW ADJ 10KOHMB	
R610	ERD25TLJ224	C 220KOHM, J,1/4W	
R611	ERD25TLJ391	C 390OHM, J,1/4W	
R612	ERD25TLJ391	C 390OHM, J,1/4W	
R613	ERD25TLJ391	C 390OHM, J,1/4W	
R614	ERD25TJ122	C 1.2KOHM, J,1/4W	
R615	ERD25TJ182	C 1.8KOHM, J,1/4W	
R616	ERD25TLJ154	C 150KOHM, J,1/4W	
R617	ERD25TLJ101	C 100OHM, J,1/4W	
R620	ERD25TJ183	C 18KOHM, J,1/4W	
R621	ERD25TJ153	C 15KOHM, J,1/4W	
R622	ERD25TJ273	C 27KOHM, J,1/4W	
R623	EVJFLAE01B14	COLOR 10KOHMB	
R624	ERD25TJ562	C 5.6KOHM, J,1/4W	
R625	ERD25TJ392	C 3.9KOHM, J,1/4W	

Ref. No.	Parts No.	Description	
R626	EVJFLAE01B14	TINT 10KOHMB	
R627	ERD25TJ222	C 2.2KOHM, J,1/4W	
R801	ERF3AKR82H	W 0.82OHM, J, 3W	⚠
R802	ERQ3CJ6R8	F 6.8OHM, J, 3W	⚠
R803	ERF15ZJ221	W 220OHM, J, 15W	⚠
R804	ERD25TLJ224	C 220KOHM, J,1/4W	⚠
R805	ERD50FJ103	C 10KOHM, J,1/2W	⚠
R806	ERD25FJ470	C 47OHM, J,1/4W	⚠
R807	ERF25FJ390	C 39OHM, J,1/4W	⚠
R808	ERG2ANJ183H	M 18KOHM, J, 2W	⚠
R809	ERC12ZGK824	S 820KOHM, K,1/2W	⚠
R810	ERD25TLJ154	C 150KOHM, J,1/4W	⚠
R812	ERX12SJR47P	M 0.47OHM, J,1/2W	⚠
R1001	RDS2TJ332	C 3.3KOHM,J,1/4W	
R1002	RDS2TJ470	C 47OHM,J,1/4W	
R1003	RDS2TJ223	C 22KOHM,J,1/4W	
R1004	RDS2TJ1R8	C 1.8OHM,J,1/4W	
R1005	RDS2TJ1R8	C 1.8OHM,J,1/4W	
	CAPACITORS		
C010	ECEA0JS101	E 100UF, 6.3V	
C011	ECEA1HS100	E 10UF, 50V	
C012	ECKF1H561KB	C 560PF, K, 50V	
C015	ECKF1H223ZF	C 0.022UF, Z, 50V	
C016	ECKF1H223ZF	C 0.022UF, Z, 50V	
C017	ECKF1H223ZF	C 0.022UF, Z, 50V	
C018	ECKF1H223ZF	C 0.022UF, Z, 50V	
C020	ECQM1H393KZ	P 0.039UF, K, 50V	
C021	ECQM1H224KZ	P 0.22UF, K, 50V	
C022	ECKF1H103ZF	C 0.01UF, Z, 50V	
C023	ECEA1ES100	E 10UF, 25V	
C024	ECKF1H103ZF	C 0.01UF, Z, 50V	
C025	ECEA1CS100	E 10UF, 16V	
C026	ECEA1CS470	E 47UF, 16V	
C028	ECEA1HS100	E 10UF, 50V	
C029	ECKF1H103ZF	C 0.01UF, Z, 50V	
C030	ECKF1H122KB	C 1200PF, K, 50V	
C031	ECKF1H103ZF	C 0.01UF, Z, 50V	
C032	ECKF1H103ZF	C 0.01UF, Z, 50V	
C033	ECEA1CS100	E 10UF, 16V	
C034	ECKF1H103ZF	C 0.01UF, Z, 50V	
C035	ECV1ZW40X32	TRIMMER	
C036	ECCF1H390JP	C 39PF, J, 50V	
C037	ECCF1H560JP	C 56PF, J, 50V	
C038	ECKF1H103ZF	C 0.01UF, Z, 50V	
C039	ECKF1H103ZF	C 0.01UF, Z, 50V	
C040	ECKF1H103ZF	C 0.01UF, Z, 50V	
C041	ECKF1H103ZF	C 0.01UF, Z, 50V	
C042	ECKF1H103ZF	C 0.01UF, Z, 50V	
C043	ECEA0JS471	E 470UF, 6.3V	
C045	ECEA1HSR22	E 0.22UF, 50V	
C046	ECEA2ES330	E 33UF, 250V	⚠
C047	ECEA2AS470	E 47UF, 100V	⚠
C049	ECKF1H103ZF	C 0.01UF, Z, 50V	
C052	ECEA0JS222	E 2200UF, 6.3V	
C053	ECEA0JS101	E 100UF, 6.3V	
C055	ECKF1H103ZF	C 0.01UF, Z, 50V	
C056	ECEA1CS100	E 10UF, 16V	
C057	ECKF1H103ZF	C 0.01UF, Z, 50V	
C060	ECEA1CS470	E 47UF, 16V	
C061	ECKF1H182KB	C 1800PF, K, 50V	
C062	ECEA1HSR22	E 0.22UF, 50V	

Ref. No.	Parts No.	Description
C063	ECKF1H103ZF	C 0.01UF, Z, 50V
C064	ECEA50ZR33	E 0.33UF, 50V
C066	ECKF1H103ZF	C 0.01UF, Z, 50V
C067	ECKF1H103ZF	C 0.01UF, Z, 50V
C068	ECKF1H103ZF	C 0.01UF, Z, 50V
C069	ECKF1H103ZF	C 0.01UF, Z, 50V
C070	ECKF1H103ZF	C 0.01UF, Z, 50V
C071	ECKF1H103ZF	C 0.01UF, Z, 50V
C072	ECKF1H103ZF	C 0.01UF, Z, 50V
C073	ECKF1H103ZF	C 0.01UF, Z, 50V
C101	TCBL1E103NR	C 0.01UF, N, 25V
C102	TCBL1E103NR	C 0.01UF, N, 25V
C104	TCBL1E103NR	C 0.01UF, N, 25V
C105	TCBL1E103NR	C 0.01UF, N, 25V
C106	ECQV1H124JZ	P 0.12UF, J, 50V
C107	ECEA1CU100	E 10UF, 16V
C108	ECEA1HU010	E 1UF, 50V
C109	ECEA1HUR47	E 0.47UF, 50V
C110	ECCF1H040CC	C 4PF, C, 50V
C111	ECCF1H040CC	C 4PF, C, 50V
C112	TCBL1E103NR	C 0.01UF, N, 25V
C113	TCBL1H040CC	C 4PF,J, 50V
C114	TCBL1E103NR	C 0.01UF, N, 25V
C115	ECEA1HU010	E 1UF, 50V
C116	ECEA50Z3R3	E 3.3UF, 50V
C117	TCBL1E103NR	C 0.01UF, N, 25V
C119	TCBL1E103NR	C 0.01UF, N, 25V
C120	TCBL1E103NR	C 0.01UF, N, 25V
C131	ECQM1H393KV	P 0.039UF, K, 50V
C133	ECEA1CU101	E 100UF, 16V
C135	ECEA1CU470	E 47UF, 16V
C137	ECEA1AU101	E 100UF, 10V
C138	TCBL1H330JCH	C 33PF, 50V
C139	ECEA1EU4R7	E 4.7UF, 25V
C146	TCBL1H103NR	C 0.01UF, J, 50V
C150	ECCF1H120JC	C 12PF, J, 50V
C151	ECCF1H680JP	C 68PF, J, 50V
C152	TCBL1E103NR	C 0.01UF, N, 25V
C201	ECQM1H473KV	P 0.047UF, K, 50V
C202	TCBL1H120JCH	C 12PF, J, 50V
C203	ECCF1H820JP	C 82PF, J, 50V
C204	ECQM1H563KV	P 0.056UF, K, 50V
C205	ECEA1HN010S	E 1UF, 50V
C206	ECEA1CU220	E 22UF, 16V
C207	ECQM1H103KV	P 0.01UF, K, 50V
C208	ECQM1H104KV	P 0.1UF, K, 50V
C209	ECEA1EU471	E 470UF, 25V
C211	ECEA1EU331	E 330UF, 25V
C212	ECEA1CU331	E 330UF, 16V
C213	ECEA1HU3R3	E 3.3UF, 50V
C214	ECQM1H124KV	P 0.12UF, K, 50V
C215	ECEA1HU3R3	E 3.3UF, 50V
C216	TCBL1E103NR	C 0.01UF, N, 25V
C217	ECCF1H030CC	C 3PF, C, 50V
C218	ECCF1H820JP	C 82PF, J, 50V
C219	TCBL1E103NR	C 0.01UF, N, 25V
C220	TCBL1H3R3KCH	C 3.3PF, C, 50V
C301	ECEA1CN100S	E 10UF, 16V
C302	TCBL1H560J	C 56PF, J, 50V
C303	ECQM1H273KV	P 0.027UF, K, 50V

Ref. No.	Parts No.	Description	
C304	ECEA1CU100	E 10UF, 16V	
C306	ECEA1HU010	E 1UF, 50V	
C307	ECEA1CU100	E 10UF, 16V	
C308	ECQM1H124KV	P 0.12UF, K, 50V	
C309	ECEA1HU010	E 1UF, 50V	
C310	ECEA1CU100	E 10UF, 16V	
C311	ECEA50ZR15	E 0.15UF, 50V	
C351	ECKD3D102KB4	C 1000PF, K, 2KV	
C352	ECKD2H151KB2	C 150PF, K,500V	
C353	ECKF1H681KB	C 680PF, K, 50V	
C354	ECKF1H821KB	C 820PF, K, 50V	
C355	ECKF1H681KB	C 680PF, K, 50V	
C401	ECEA50ZR68	E 0.68UF, 50V	
C402	TCBL1H122MD	C 1200PF, M, 50V	
C403	ECEA1CU100	E 10UF, 16V	
C404	ECEA1CU101	E 100UF, 16V	
C405	ECQM1H123KV	P 0.012UF, K, 50V	
C406	ECEA50Z3R3	E 3.3UF, 50V	
C407	ECEA50Z3R3	E 3.3UF, 50V	
C408	ECEA1CU100	E 10UF, 16V	
C409	ECEA1VU4R7	E 4.7UF, 35V	
C410	TCBL1H391KB	C 390PF, K, 50V	
C411	ECQM1H223KV	P 0.022UF, K, 50V	
C451	ECEA1VU101	E 100UF, 35V	
C453	ECEA1CU102	E 1000UF, 16V	
C454	ECQM1223KZ	P 0.022UF, K,100V	
C501	ECQM1H123KV	P 0.012UF, K, 50V	
C502	ECQM1H153KV	P 0.015UF, K, 50V	
C503	ECQK1682JZ	P 6800PF, J,100V	
C504	ECEA1HU2R2	E 2.2UF, 50V	
C505	ECQM1H153KV	P 0.015UF, K, 50V	
C506	ECEA1CU470	E 47UF, 16V	
C507	ECEA1CU100	E 10UF, 16V	
C508	ECKD2H272KB	C 2700PF, K,500V	
C531	ECEA1HG100S	E 10UF, 50V	⚠
C551	ECKD3D122JBN	C 1200PF, K, 2KV	⚠
C552	ECWH12H562JS	P 5600PF,J,1.2KV	⚠
C553	ECQM1H563KV	P 0.056UF, K, 50V	⚠
C554	ECQF2H364JZA	P 0.36UF, J,200V	⚠
C555	ECEA2ES100	E 10UF, 250V	⚠
C556	ECEA1VU331	E 330UF, 35V	⚠
C557	ECEA1HG100S	E 10UF, 50V	⚠
C558	ECEA1CG331S	E 330UF, 16V	⚠
C559	ECKD2H221KB2	C 220PF, K,500V	⚠
C563	ECEA2DS010	E 1UF, 200V	
C564	ECEA1HU100	E 10UF, 50V	⚠
C565	ECEA1HU470	E 470UF, 50V	
C581	ECQM1H473KV	P 0.047UF, K, 50V	⚠
C601	TCBL1H470J	C 47PF, J, 50V	
C602	TCBL1H470J	C 47PF, J, 50V	
C605	TCBL1H102KB	C 1000PF, K, 50V	
C606	ECEA1EU4R7	E 4.7UF, 25V	
C607	ECEA50ZR47	E 0.47UF, 50V	
C608	ECEA50ZR22	E 0.22UF, 50V	
C609	ECEA1EN4R7S	E 4.7UF, 25V	
C610	ECEA50ZR1	E 0.1UF, 50V	
C611	TCBL1H120JRH	C 12PF, J, 50V	
C612	TCBL1H330JRH	C 33PF, J, 50V	
C613	TCBL1H102KB	C 1000PF, K, 50V	
C614	TCBL1H330JRH	C 33PF, J, 50V	

Ref. No.	Parts No.	Description	
C615	TCBL1H471KB	C 470PF, K, 50V	
C801	ECKM2H103ZF7	C 0.01PF, Z, 500V	⚠
C803	ECKM2H103ZF7	C 0.01PF, Z,500V	⚠
C804	ECKM2H103ZF7	C 0.01PF, Z,500V	⚠
C805	ECET2DR331SW	E 330UF, 200V	⚠
C806	ECEA2CS220	E 22UF, 160V	⚠
C807	ECEA2CV150W	E 15UF, 160V	⚠
C1001	ECKF1H101KB	C 100PF, K, 50V	
C1002	ECKF1H101KB	C 100PF, K, 50V	
	COILS		
L010	TLQ068K126	PEAKING COIL 6.8U	
L011	TLQ068K126	PEAKING COIL 6.8U	
L012	TLQ068K126	PEAKING COIL 6.8U	
L013	TLQ068K126	PEAKING COIL 6.8U	
L014	TLQ068K126	PEAKING COIL 6.8U	
L015	TLQ068K126	PEAKING COIL 6.8U	
L016	TLQ068K126	PEAKING COIL 6.8U	
L017	TLQ068K126	PEAKING COIL 6.8U	
L018	TLQ068K126	PEAKING COIL 6.8U	
L020	TLQ068K126	PEAKING COIL 6.8U	
L021	TLQ068K126	PEAKING COIL 6.8U	
L023	TLQ068K126	PEAKING COIL 6.8U	
L024	TSC925-4	CHOKE COIL	
L025	TLQ068K126	PEAKING COIL 6.8U	
L026	TLQ068K126	PEAKING COIL 6.8U	
L027	TLQ068K126	PEAKING COIL 6.8U	
L028	TLQ068K126	PEAKING COIL 6.8U	
L029	TLQ068K126	PEAKING COIL 6.8U	
L030	TLT220K991K	PEAKING COIL 22U	
L102	TLI158755	VIDEO IF TRANS.	
L103	TLT047K991K	PEAKING COIL 4.7U	
L104	TLI67394-1	VIDEO IF TRANS	
L105	TLU120K186	PEAKING COIL	
L110	TLQ047K236C	PEAKING COIL 4.7U	
L111	TLQ018K236	PEAKING COIL 1.8U	
L151	TLT033K991K	PEAKING COIL 3.3U	
L201	TLS63318-2	SIF DISCRI.TRANS.	
L202	TLT047K991K	PEAKING COIL 4.7U	
L203	TLT047K991K	PEAKING COIL 4.7U	
L204	TLQ010K236C	PEAKING COIL 1U	
L301	TLK150828	COIL	
L302	TLK150820	PEAKING COIL	
L351	TLT151K991K	PEAKING COIL 150U	
L551	TLH15907	CHOKE COIL	⚠
L552	TLH6628P	LINEALITY COIL	⚠
L601	TLQ270J236C	PEAKING COIL 27U	
L603	TLT820K991K	PEAKING COIL 82U	
L801	TLP15518P	POWER FILTER	⚠
L802	TLQ047K126	PEAKING COIL 4.7U	⚠
	TRANSFORMERS		
T201	TLS62366-1	AUDIO IF TRANS.	
T501	TLH15412	H.DRIVE TRANS.	
T551	TLF14672B	FLYBACK TRANS	⚠
	DIODES		
D010	TVSB4302	DIODE	
D011	TVSEM1	DIODE	⚠
D012	TVSB1202	DIODE	
D013	TVSEM1	DIODE	⚠

Ref. No.	Parts No.	Description	
D014	TVSQA211B	ZENER DIODE	
D015	MA161	DIODE	
D016	TVSQA205E	ZENER DIODE	
D017	MA161	DIODE	
D018	TVSHZ11C3TE	ZENER DIODE	
D019	TVSQB105M	ZENER DIODE	
D020	TVSQA230B	DIODE	
D025	TVSQA205E	ZENER DIODE	
D027	MA161	DIODE	
D031	LN524RAS	LED (CHANNEL)	
D032	MA162	DIODE	
D033	MA162	DIODE	
D035	MA161	DIODE	
D036	MA161	DIODE	
D037	MA161	DIODE	
D038	MA161	DIODE	
D039	MA161	DIODE	
D042	MA161	DIODE	
D043	MA161	DIODE	
D044	MA161	DIODE	
D045	MA161	DIODE	
D051	MA161	DIODE	
D201	MA150	DIODE	
D302	MA150	DIODE	
D303	MA150	DIODE	
D304	MA150	DIODE	
D305	MA150	DIODE	
D351	TVSRD3.0EB2	ZENER DIODE	
D352	MA162	DIODE	
D431	MA150	DIODE	
D451	TVSB1201	DIODE	
D501	MA1200	ZENER DIODE	
D503	TVSRD3.6EL1Z	DIODE	
D531	TVSRH1S	DIODE	⚠
D532	MA150	DIODE	⚠
D533	TVSQA208G	ZENER DIODE	⚠
D551	TVSES1	DIODE	⚠
D552	TVSEU2	DIODE	⚠
D556	MA162	DIODE	
D557	TVSB4302	DIODE	⚠
D558	TVSB4302	DIODE	⚠
D801	TVSC0508	DIODE	⚠
D802	TVSC0508	DIODE	⚠
D803	TVSC0508	DIODE	⚠
D804	TVSC0508	DIODE	⚠
D805	TVSC0508	DIODE	⚠
D810	TVSC0508	DIODE	
D811	TVSC0508	DIODE	
D851	TRPF5B0M050H	POSISTOR	⚠
D1001	TVSSE303A	LED	
D1002	TVSSE303A	LED	
	I.C		
IC010	MN14823QSA	MPU	
IC011	AN6912	COMPARATOR	
IC101	AN5125M	VIF, AFT, AGC, DET	
IC201	AN5256	SIF	
IC301	AN5318A	VIDEO CHROMA	
IC401	AN5436N	H-OSC.V-OSC	⚠
IC451	AN5512	V-OUT, PULSE AMP.	
IC551	AN78M12LB	+ 12V REGULATOR	⚠

Ref. No.	Parts No.	Description
IC801	TVSSTR30130	+130V REGULATOR ⚠
IC1001	MN6027B	MICROCOMPUTER
	TRANSISTORS	
Q012	2SC1685-Q	BS2 SWITCHING
Q013	2SA564A-Q	BS2 SWITCHING
Q014	2SA564A-Q	BS1 SWITCHING
Q015	2SC1685-Q	BS1 SWITCHING
Q017	2SA564A-Q	BV/BU SWITCHING
Q018	2SA564A-Q	BV/BU SWITCHING
Q019	2SC1383NC	+12V REGULATOR
Q020	2SC1685-R	ACTIVE LOWPASS FILTER
Q023	2SA564A-Q	LED DRIVE
Q024	2SA564A-Q	LED DRIVE
Q025	2SC1685-R	ACTIVE LOWPASS FILTER
Q026	2SC1685-R	ACTIVE LOWPASS FILTER
Q027	2SC1685-Q	INVERTER.
Q028	2SC1685-Q	DC AMP
Q029	2SC1473-RNC	RELAY DRIVE
Q030	2SA564A-Q	HALT SWITCHING
Q032	2SC1685-Q	+5V REGULATOR
Q101	2SC2377-C	VIF. AMP.
Q301	2SA564-Q	VIDEO AMP.
Q351	2SC1573NC	R-OUT
Q352	2SC1573NC	B-OUT
Q353	2SC1573NC	G-OUT
Q501	2SC1473AH	H-DRIVE ⚠
Q531	2SC1685-Q	H.OSC DISABLE AMP. ⚠
Q532	2SA564A-Q	H. OSC DISABLE OUT ⚠
Q533	2SC1685-Q	H. OSC DISABLE OUT ⚠
Q551	2SD1439	H-OUT ⚠
Q552	2SC1685-Q	AVR ⚠
Q100	2SD636-R	AMP.
Q100	2SD636-R	AMP.
	OTHERS	
	A34JCD31X	PICTURE TUBE ⚠
	EAS65P07S	SPEAKER
	EUR37140	REMOTE CONTROL RECEIVER
	TBM27105	MODEL NAME PLATE FOR CTG-1362R
	TBM27132	MODEL NAME PLATE FOR CTG-1349R
	TBX1680800	PRESET BUTTON
	TBX3786600	PUSH BUTTON SET
	TBX3787500	PUSH BUTTON
	TEK6914	LOCK SWITCH (ONLY CTG-1362R)
	TES1208	COIL SPRING
	TES4239	SPRING (ONLY CTG-1362R)
	TES4576	SPRING
	TJB723000	ANTENNA ADAPTOR
	TJB729500	ANTENNA TERMINAL BOARD ⚠
	TJC6319	FUSE HOLDER
	TJS168970	3P CONNECTOR
	TJS168970	3P CONNECTOR
	TJS168980	4P CONNECTOR
	TJS168980	4P CONNECTOR
	TJS168990	5P CONNECTOR
	TJS169010	CONNECTOR
	TJS169020	8P CONNECTOR
	TJS169030	10P CONNECTOR
	TJS169040	12P CONNECTOR
	TJS35161	CRT SOCKET
	TJS49880	PIN JACK

Ref. No.	Parts No.	Description
	TKK769615	GLASS STOPPER
	TKG170733	FRONT GLASS
	TKP2713552-1	STORAGE BOX DOOR (ONLY CTG-1362R)
	TKP2716851	DOOR FOR CTG-1362R
	TKP2716852	DOOR FOR CTG-1349R
	TKY274300-2	CABINET FOR CTG-1362R
	TKY274301-2	CABINET FOR CTG-1349R
	TLC2042-1	CONVERGENCE YOKE
	TLK169063N	DEGAUSSING COIL ⚠
	TLY25307F	DEFLECTION YOKE ⚠
	TMM15545	EJECTER RUBBER (ONLY CTG-1362R)
	TMM17553	DY WEDGE
	TNA19940	ISOLATION BOX ⚠
	TNP52043TQ	S-BOARD
	TNP52156ZA	B-BOARD
	TNP52157ZA	G-BOARD
	TNP52923ZA	CRT-BOARD
	TNP66837W	A-BOARD
	TNQ2405	REMOTE CONTROL TRANSMITTER
	TNV56461G2	U/V TUNER ⚠
	TPC181841	OUTER CARTON FOR CTG-1362R
	TPC181842	OUTER CARTON FOR CTG-1349R
	TPD191338	CUSHION (UPPER)
	TPD192341	CUSHION (BOTTOM)
	TPE14719-2	SET COVER
	TQB621185	FAN BAG
	TSA343	UHF ANTENNA
	TSA8108-7	VHF ANTENNA
	TSX2143-1	POWER SUPPLY CORD ⚠
	TKU282900	REAR COVER
	TXFMK01H55	MAGNET
	UR50EC332B	BATTERY COVER
F001	XBA1F40NU100	FUSE 125V 4A ⚠
RL010	TSE1839	RELAY ⚠
S301	EVQR1AL13	SERVICE SW.
SW020	EVQQS607T	POWER SW.
SW021	EVQQS607T	CHANNEL DOWN SW.
SW022	EVQQS607T	CHANNEL UP SW.
SW023	EVQQS607T	VOLUME DOWN SW.
SW024	EVQQS607T	VOLUME UP SW.
SW025	EVQQS607T	CHANNEL-SET SW.
SW026	EVQQS607T	CHANNEL-ADD SW.
SW027	EVQQS607T	CHANNEL ERASE SW.
SW033	ESD32216	CATV SELECT SW.
SW151	TSE10409	AFT SW.
SW301	TSE10409	COLORPILOT SW.
X010	TSS132M1	CRYSTAL
X101	TFCH45MVZ01	SAW FILTER
X102	EFCS4R5MW3BA	CERAMIC TRAP
X201	EFCS4R5MS4E	CERAMIC TRAP
X601	TSS816-N2	CRYSTAL
X1001	CSB455EB1	CRAMIC OSCILLATOR

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